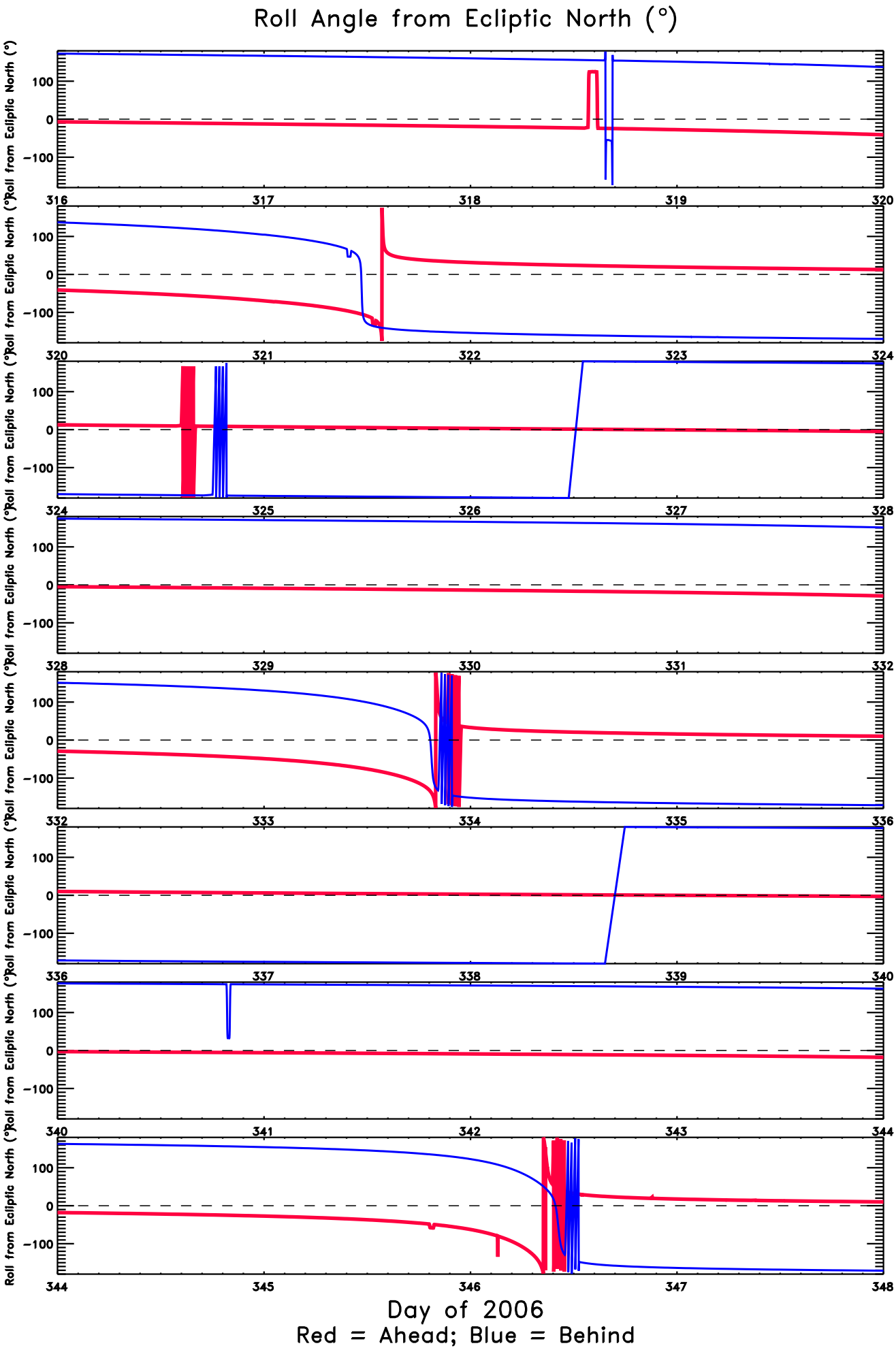
Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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0
−100
316
317
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320
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325
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328
329
330
331
332
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346
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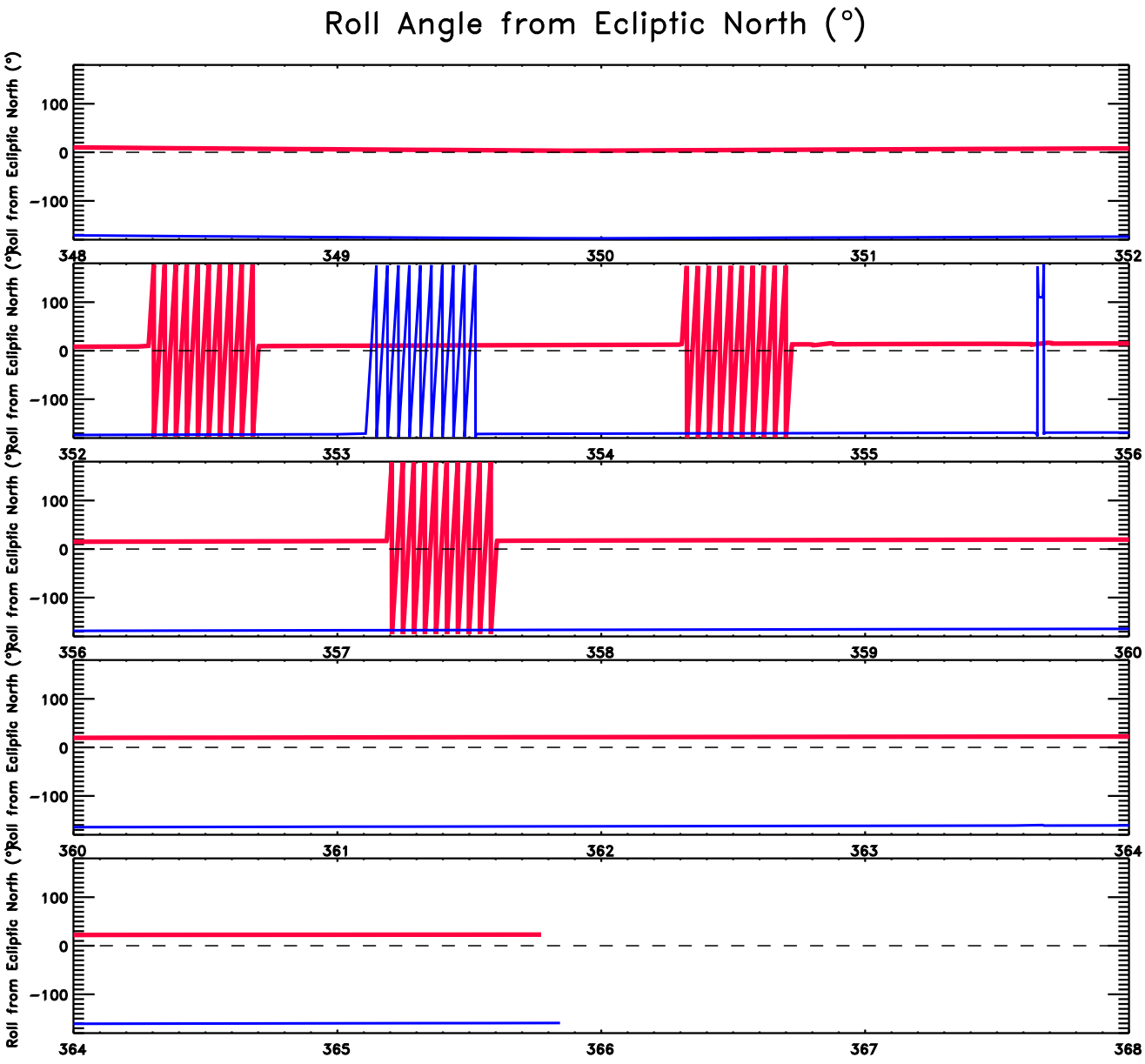
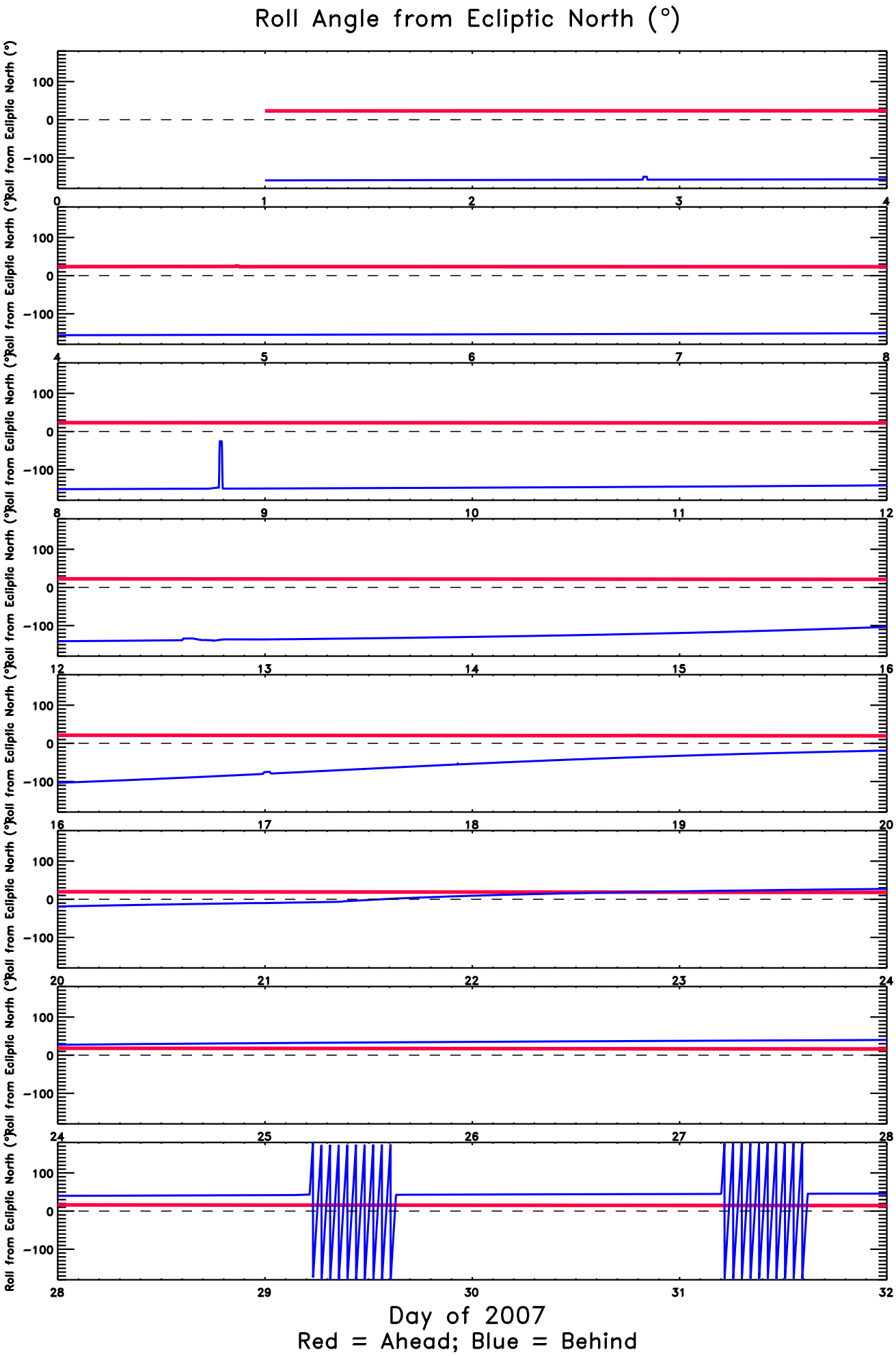
348
Day of 2006
Red = Ahead; Blue = Behind



Day of 2006
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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−100
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12
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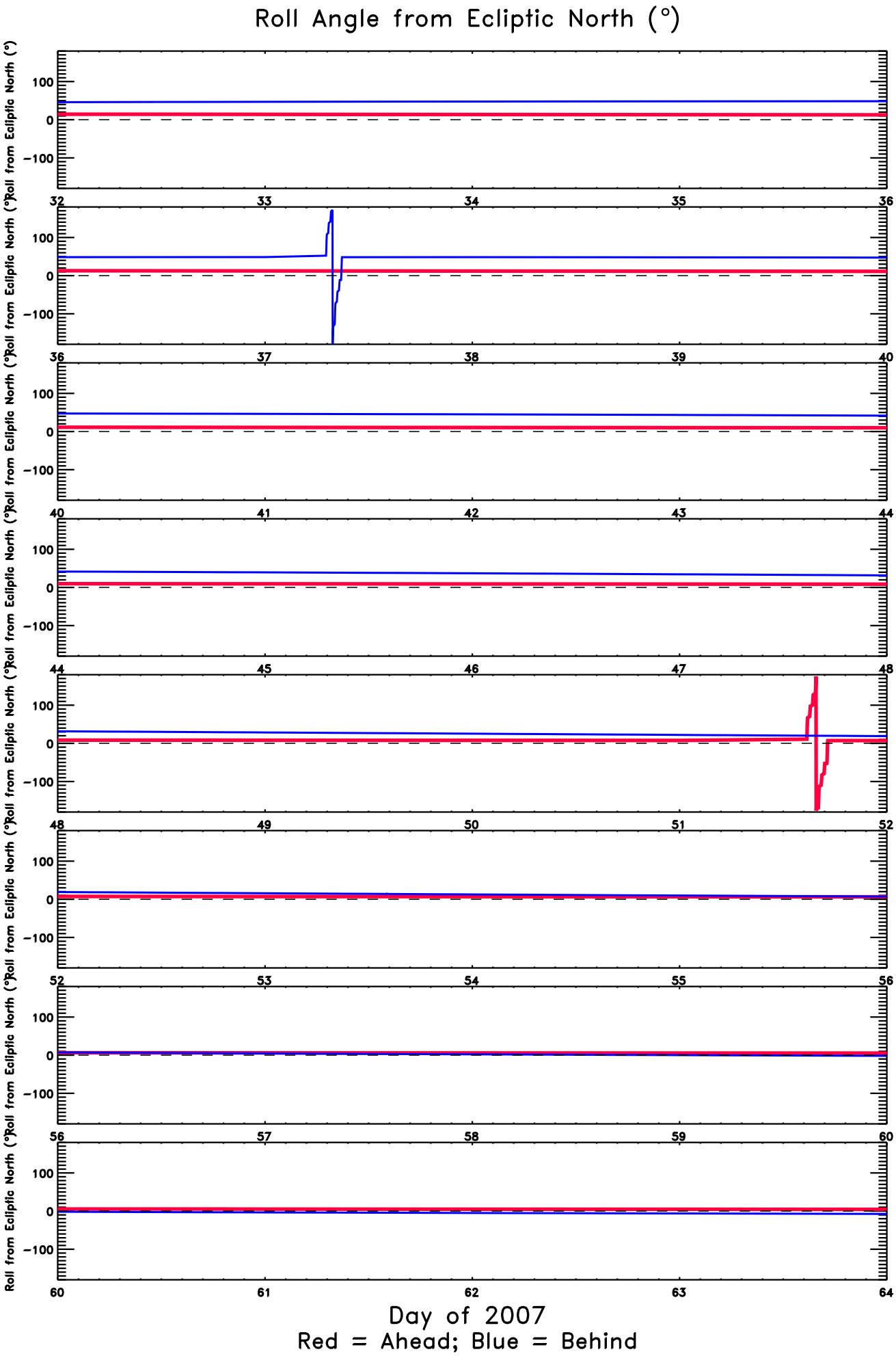
Day of 2007
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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−100
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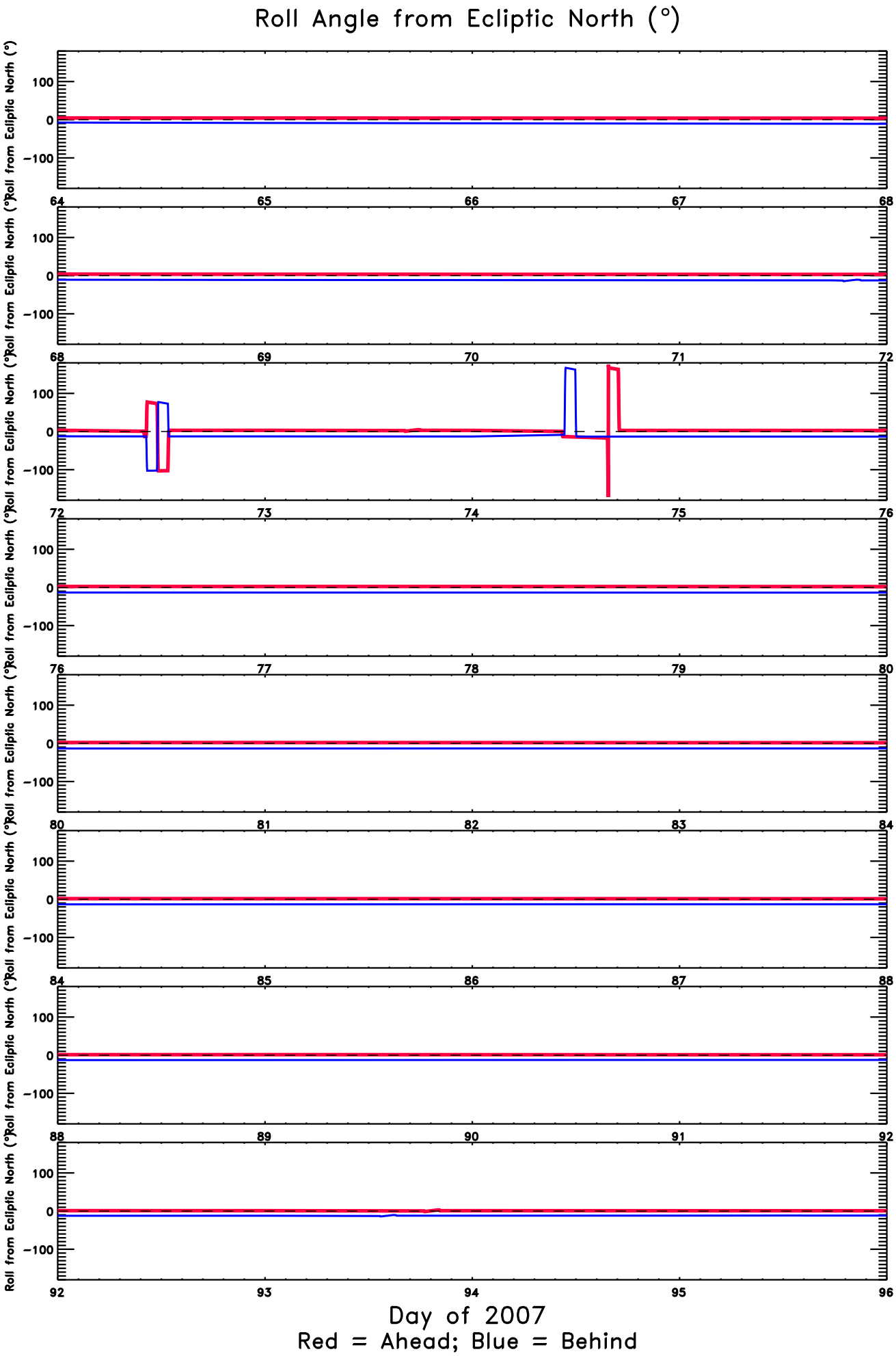
Day of 2007
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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−100
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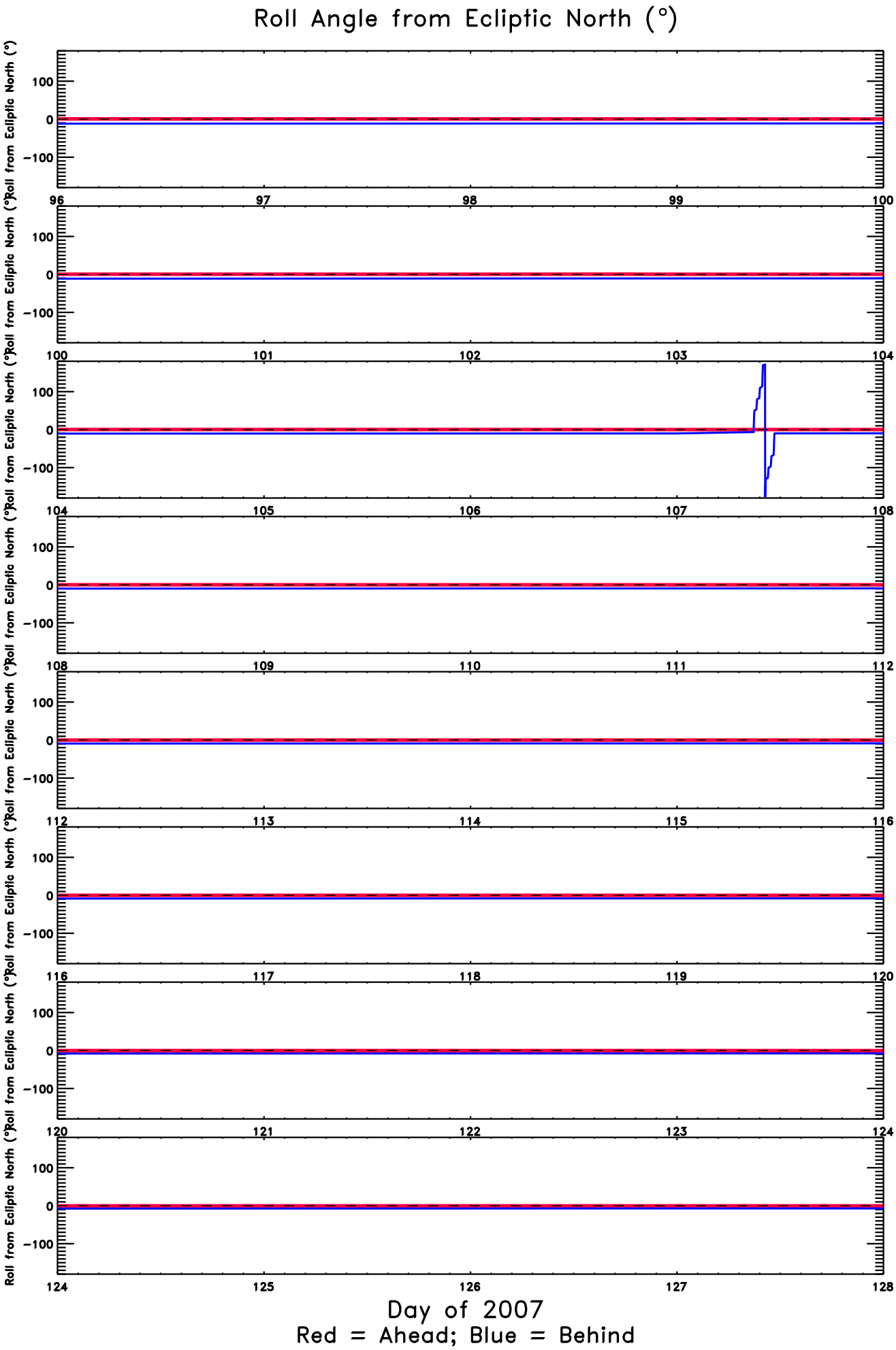
Day of 2007
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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−100
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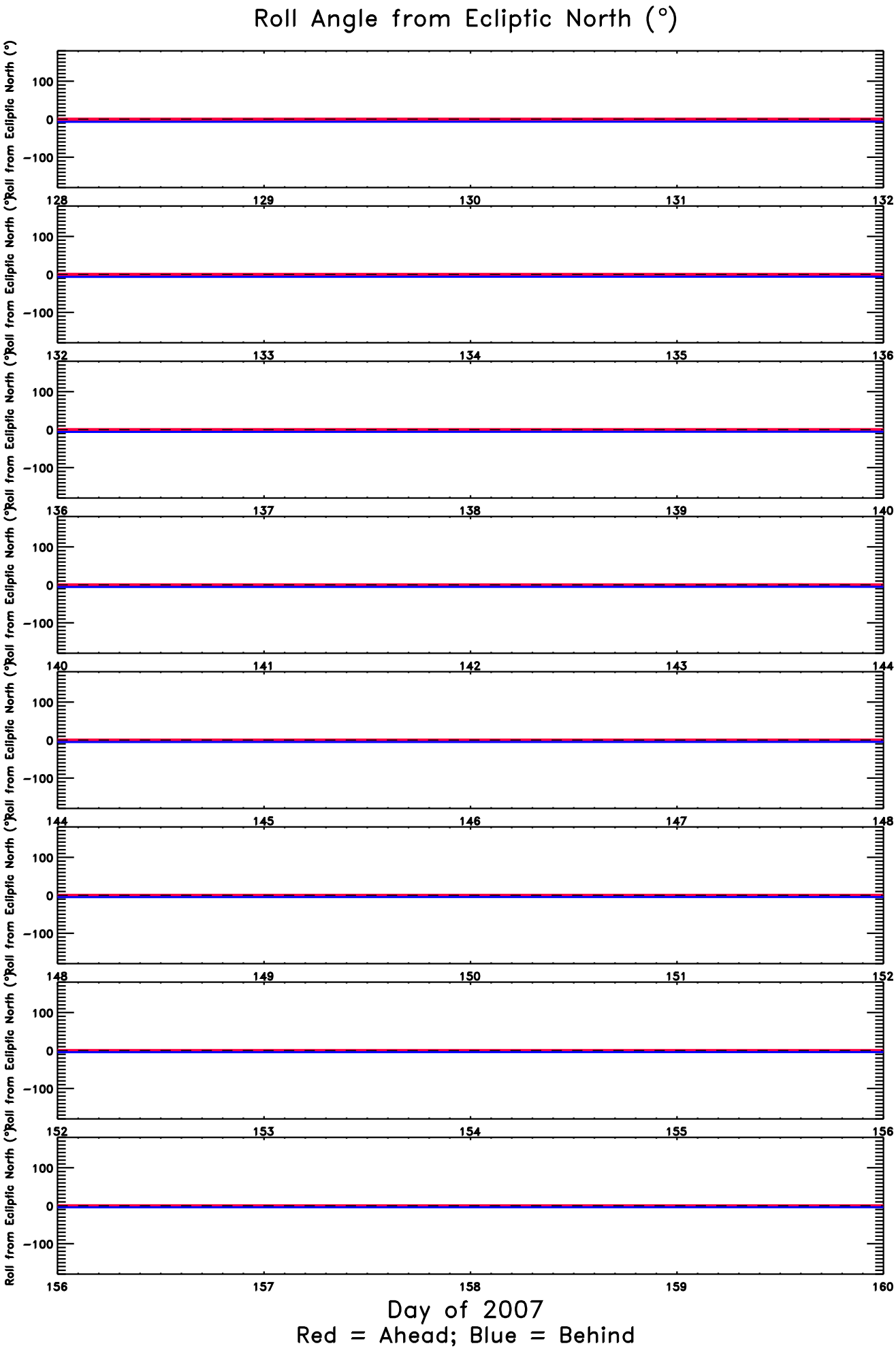
Day of 2007
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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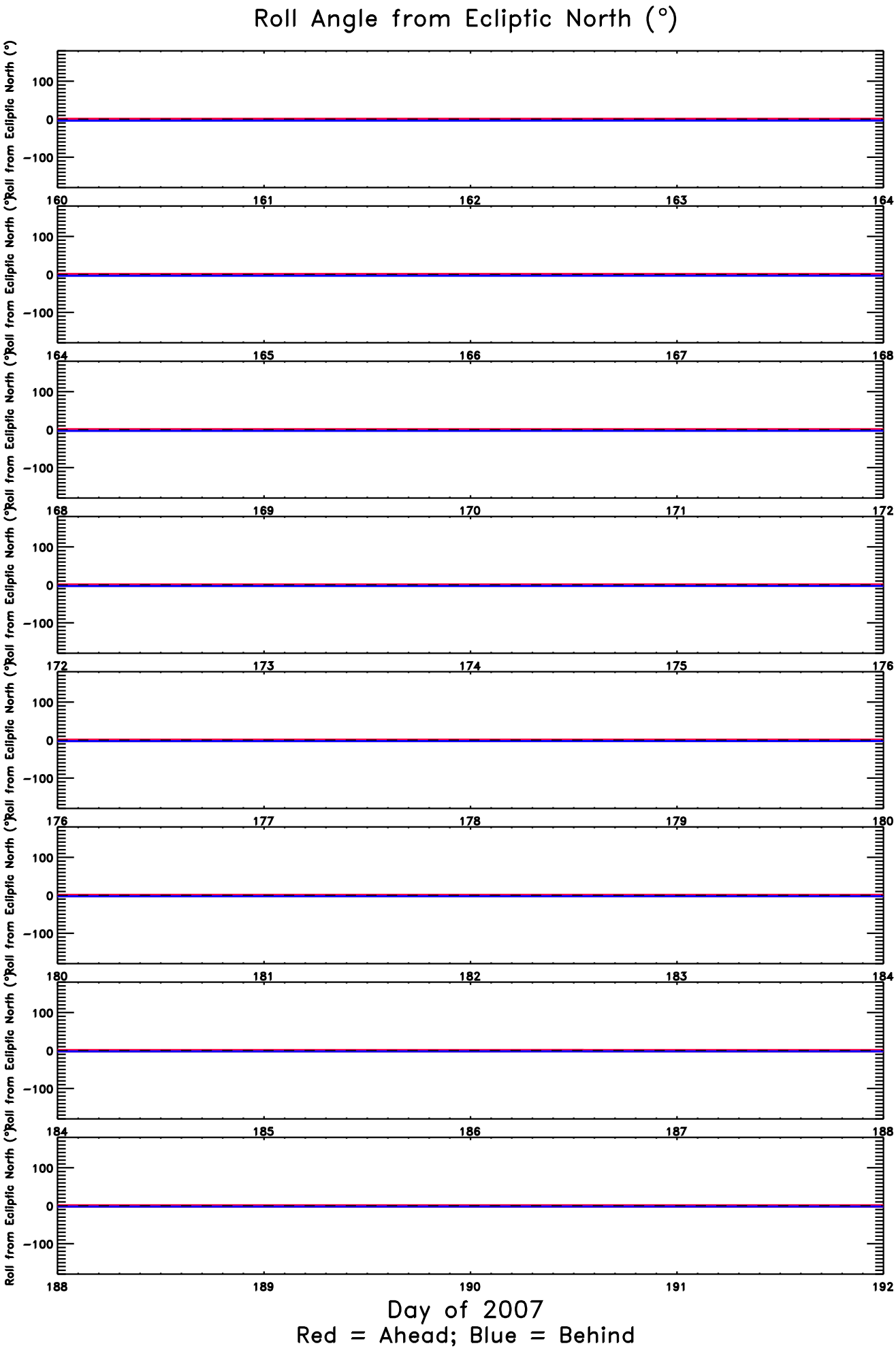
Day of 2007
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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−100
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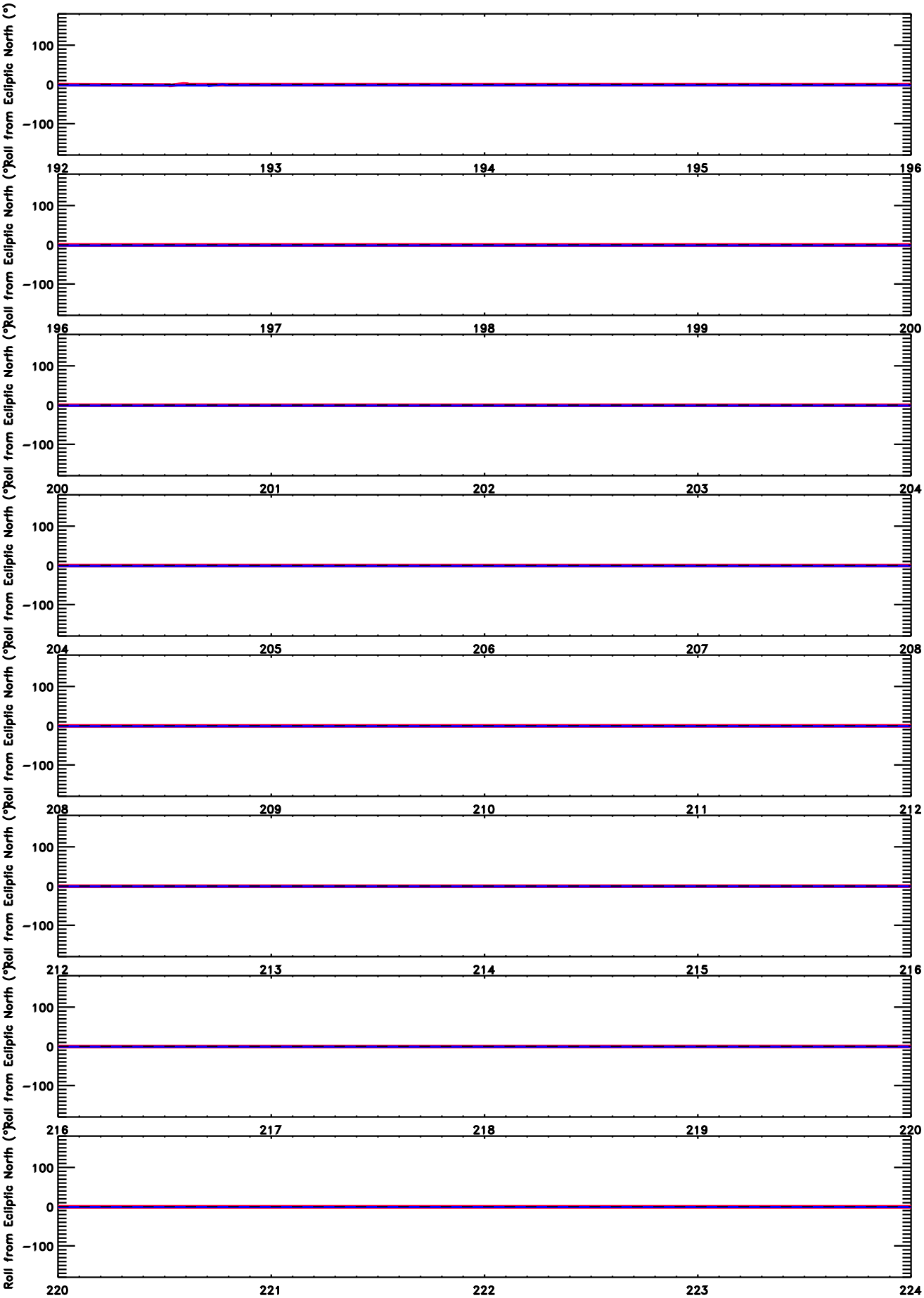
192
Day of 2007
Red = Ahead; Blue = Behind

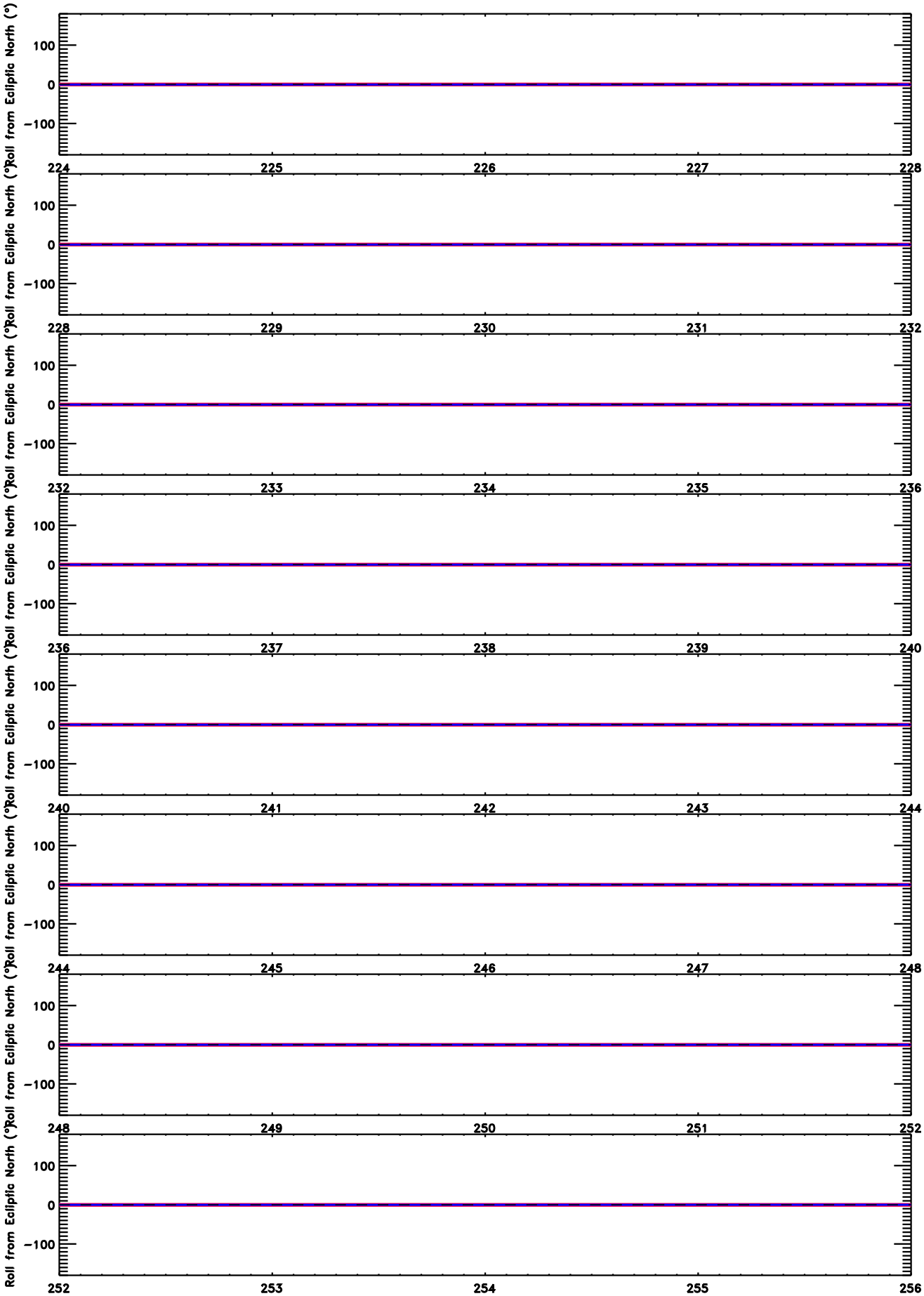
Roll Angle from Ecliptic North (°)



Day of 2007

Red = Ahead; Blue = Behind

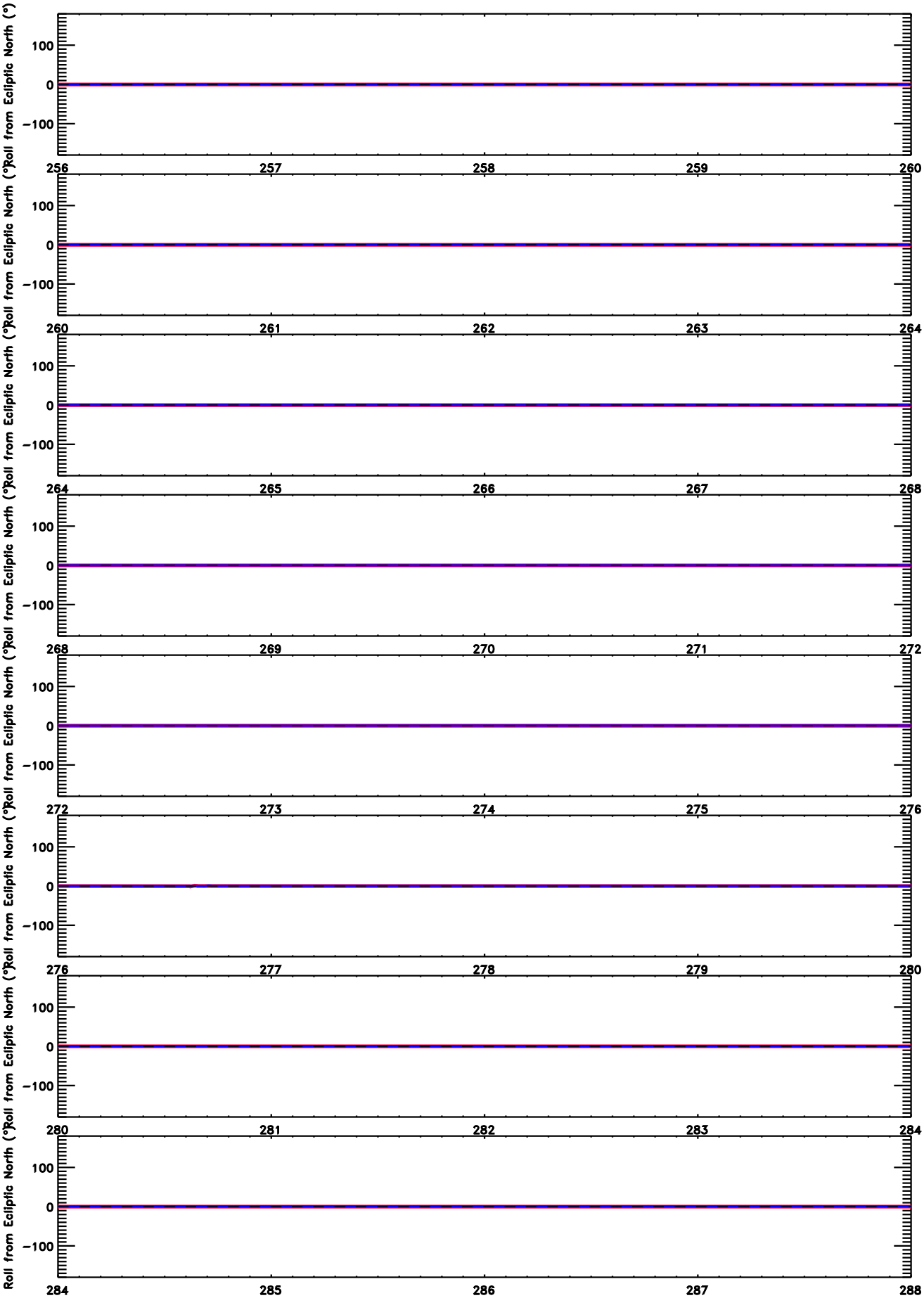
Roll Angle from Ecliptic North (°)



Day of 2007

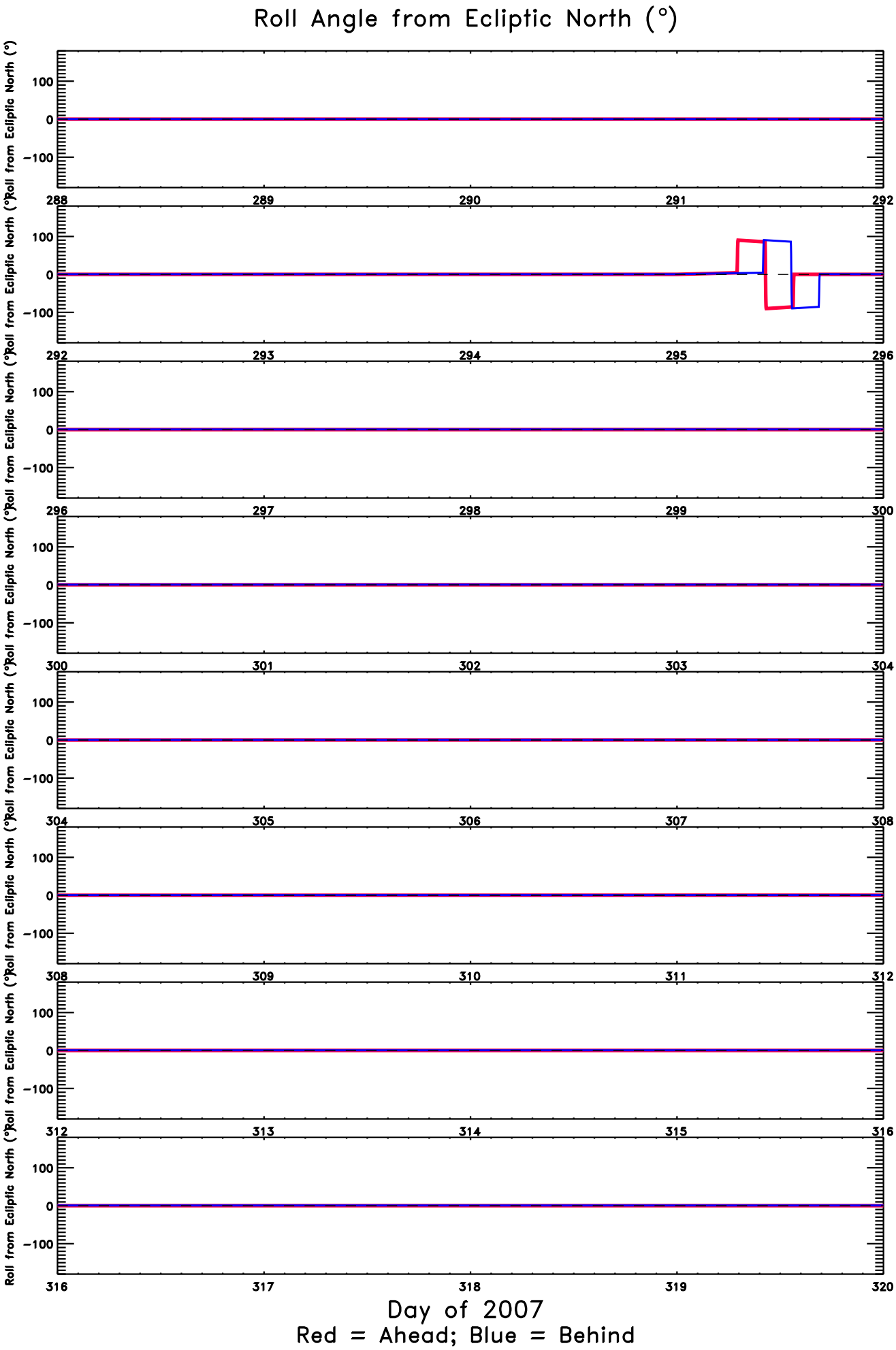
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2007

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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288
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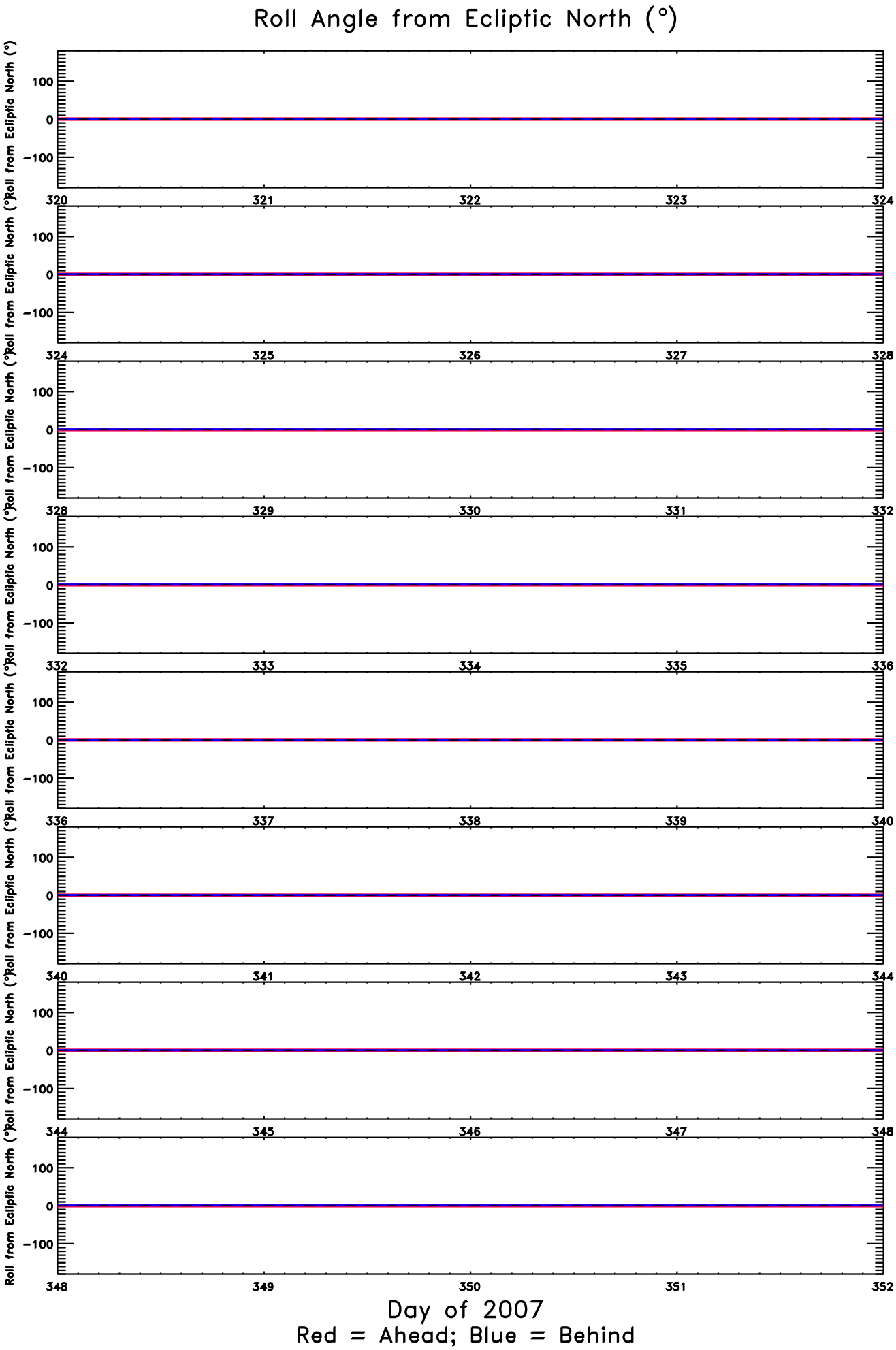
Day of 2007
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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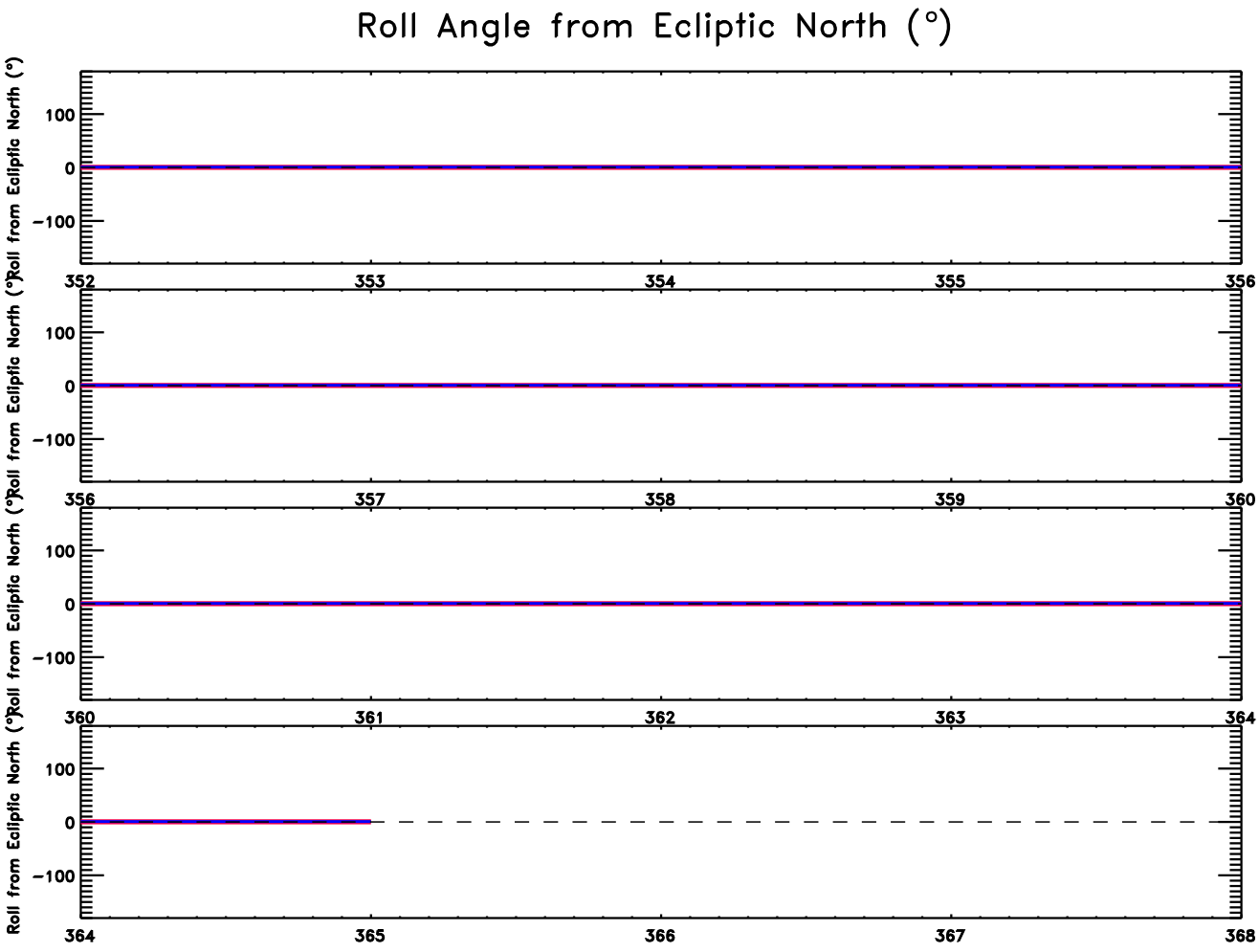
351
352
Day of 2007
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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−100
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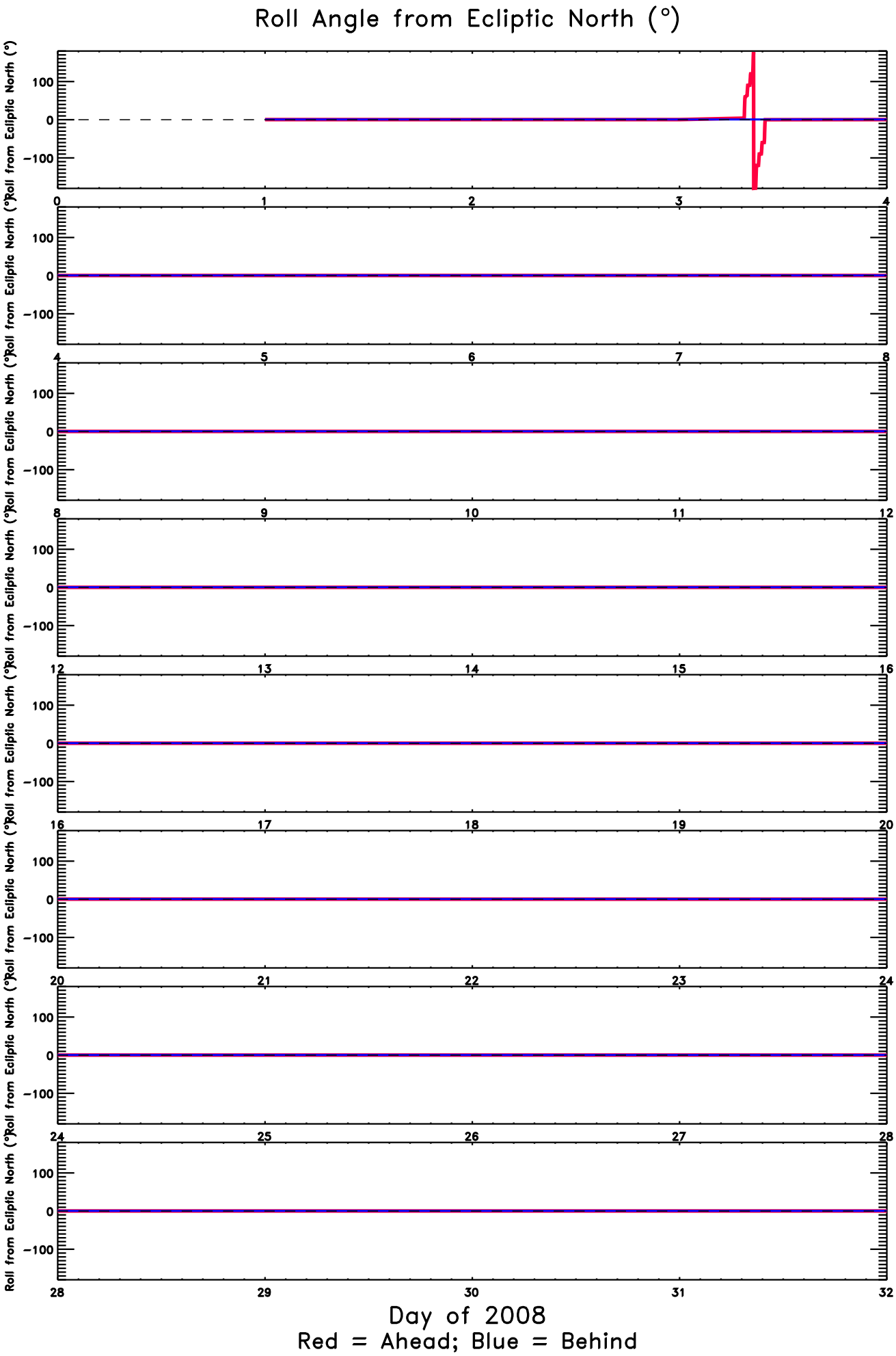
Day of 2007
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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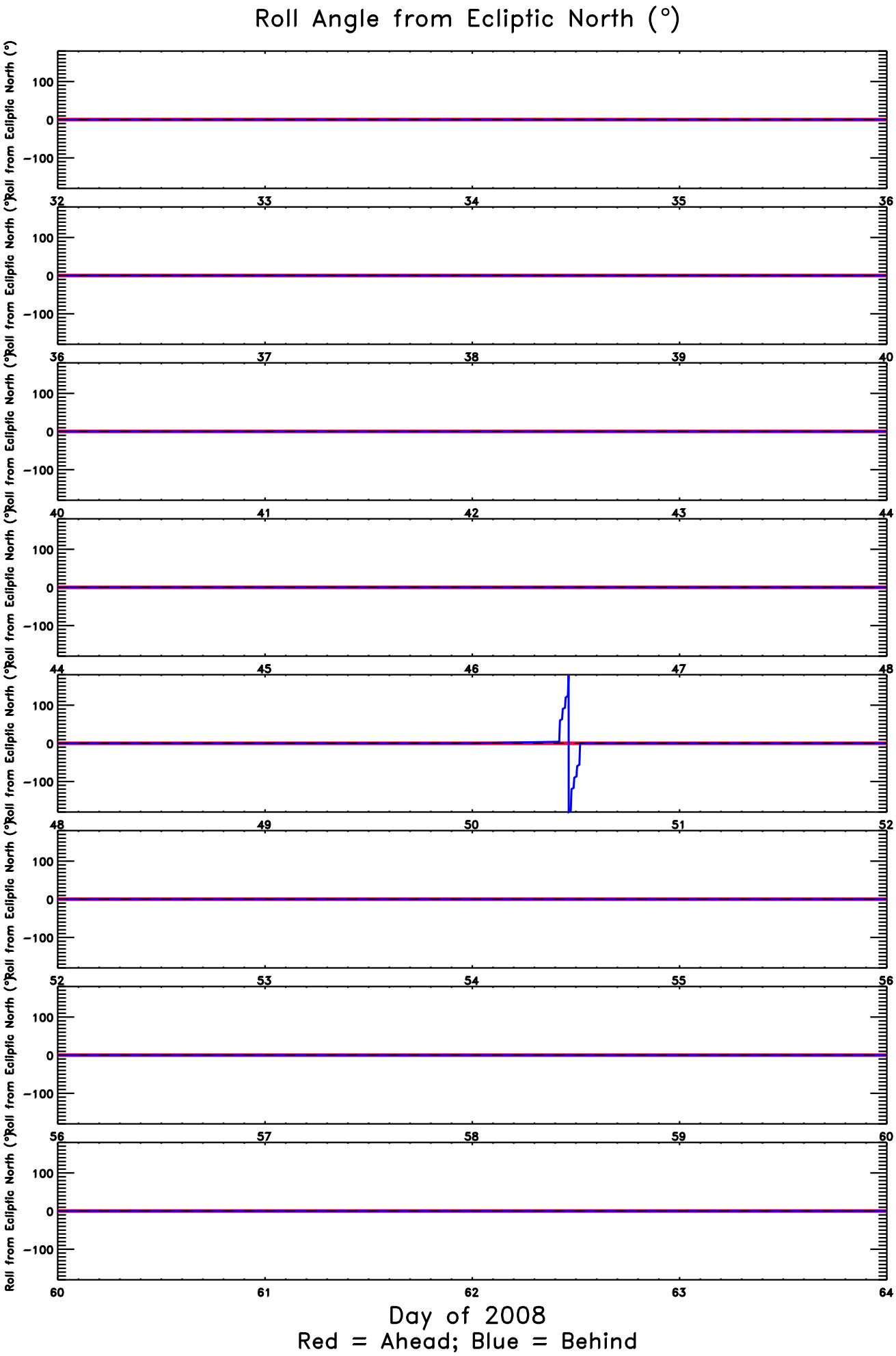
Day of 2008
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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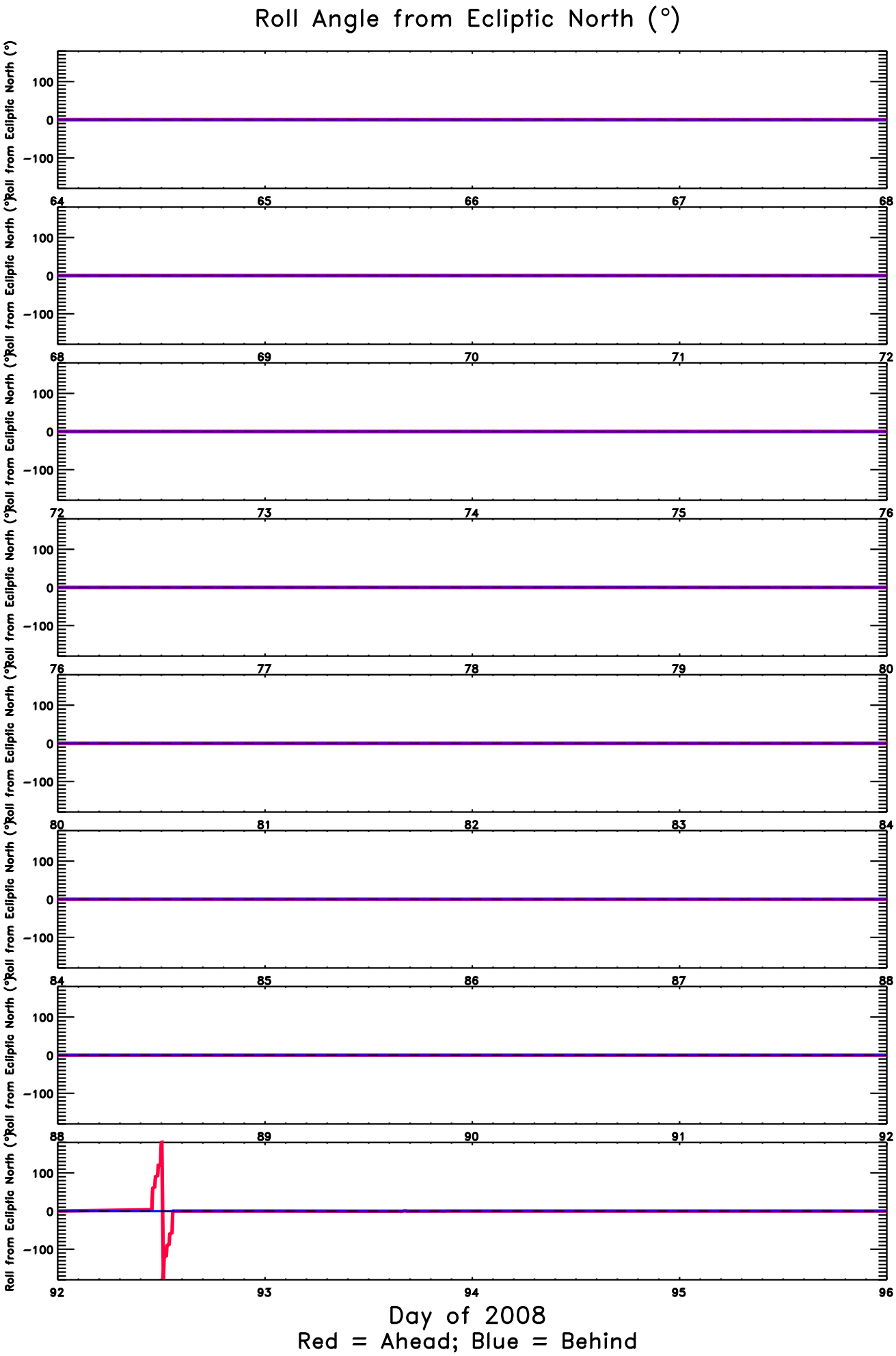
64
Day of 2008
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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−100
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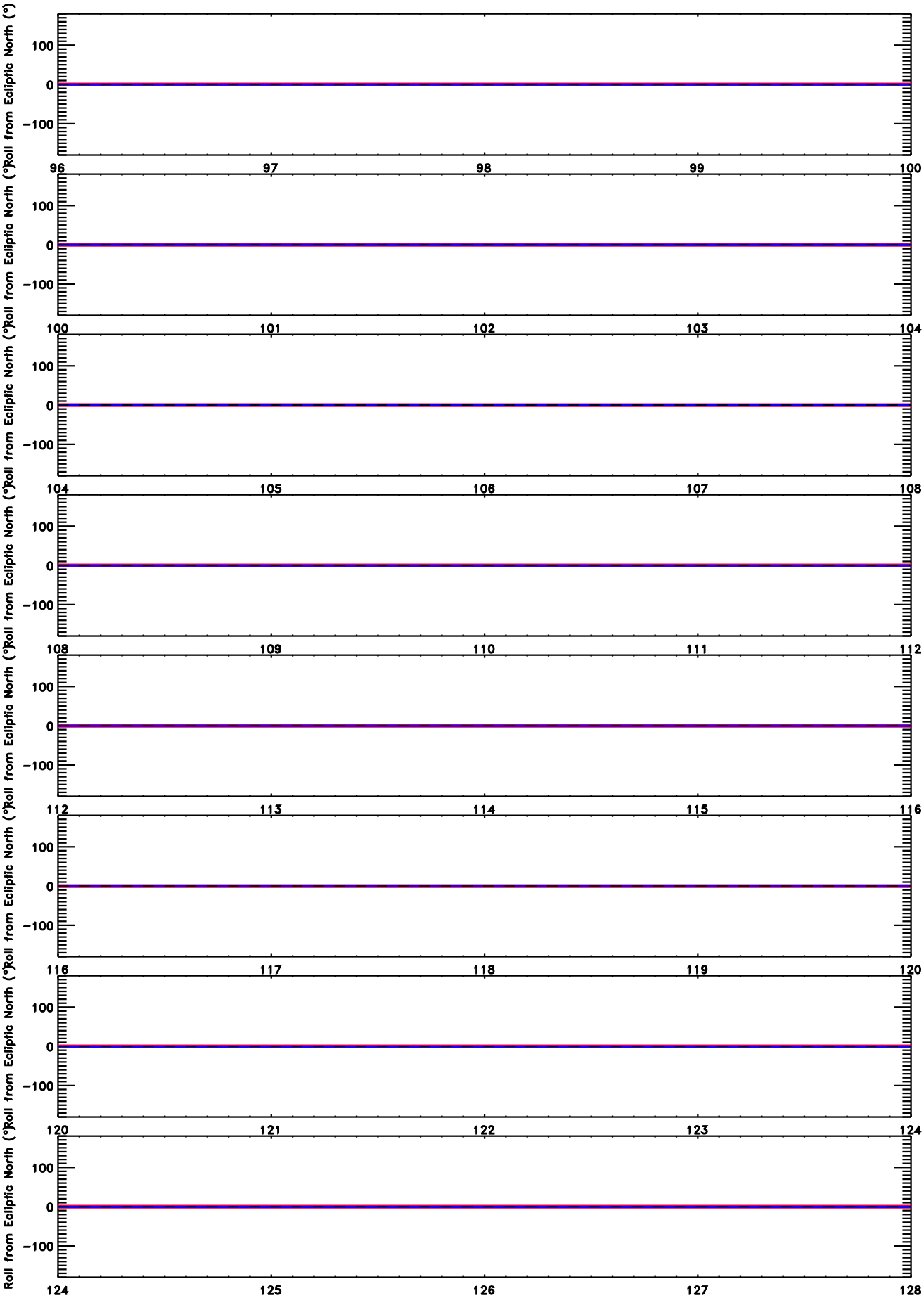
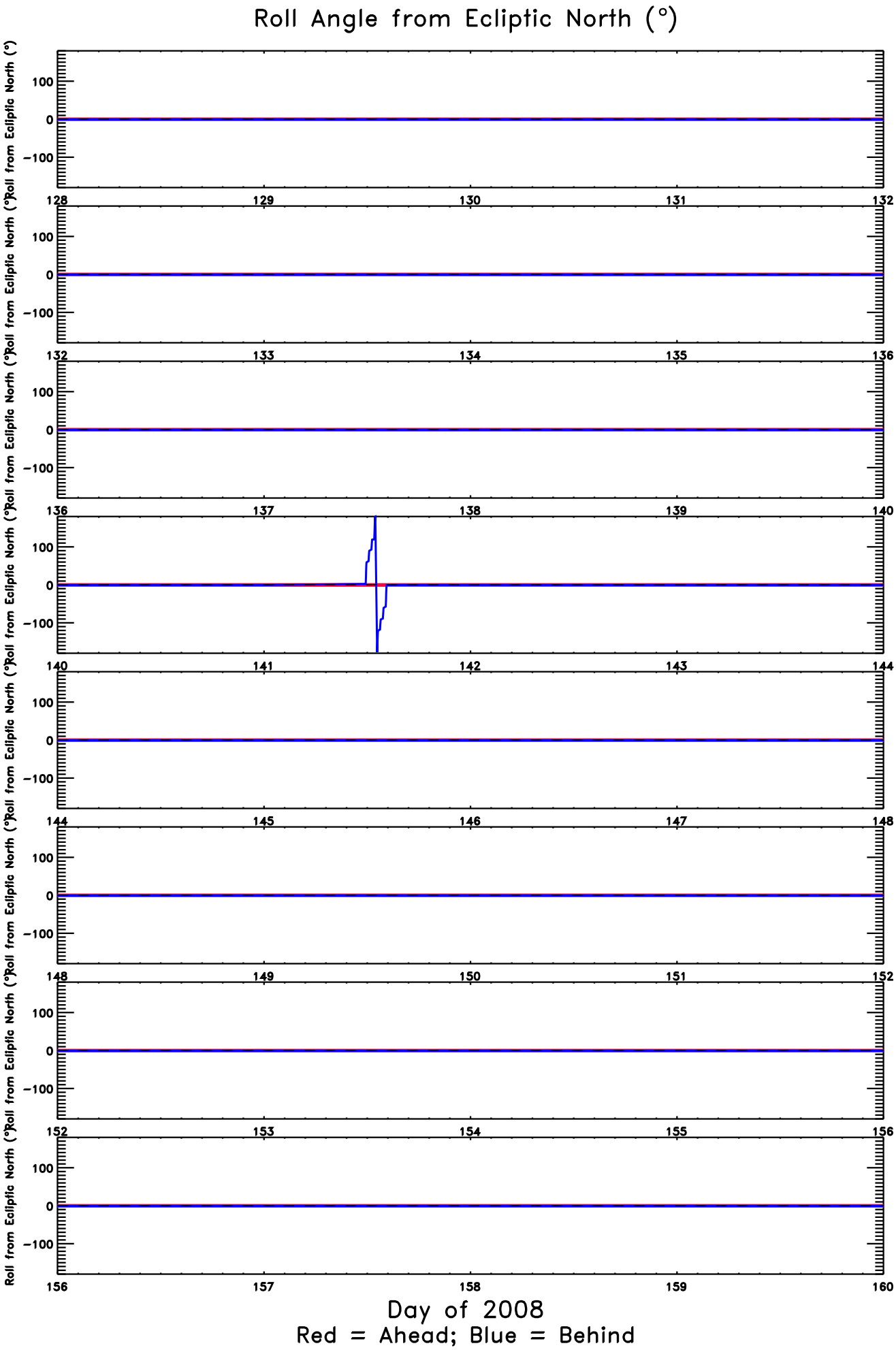
96
Day of 2008
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2008

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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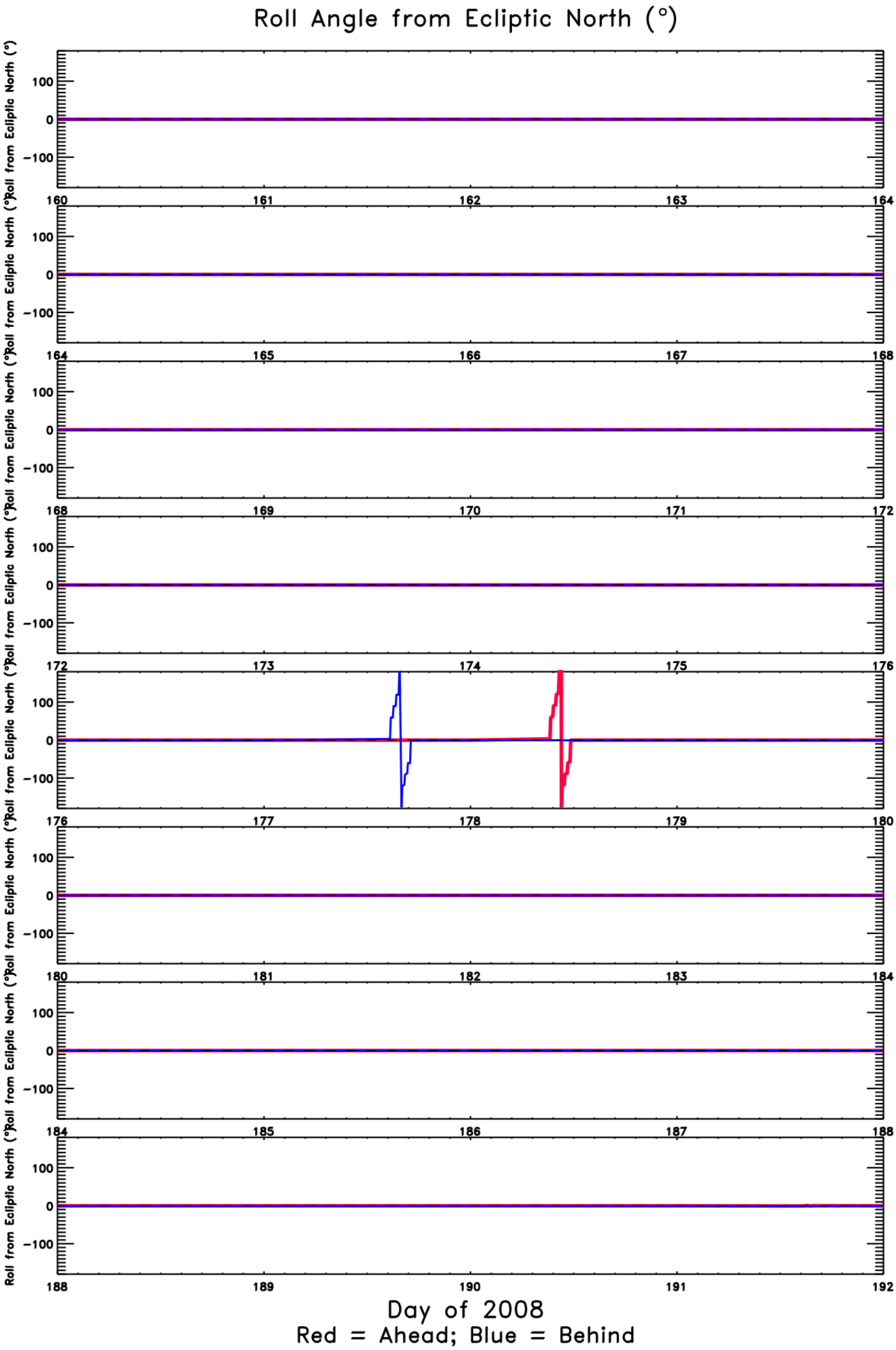
158
159
160
Day of 2008
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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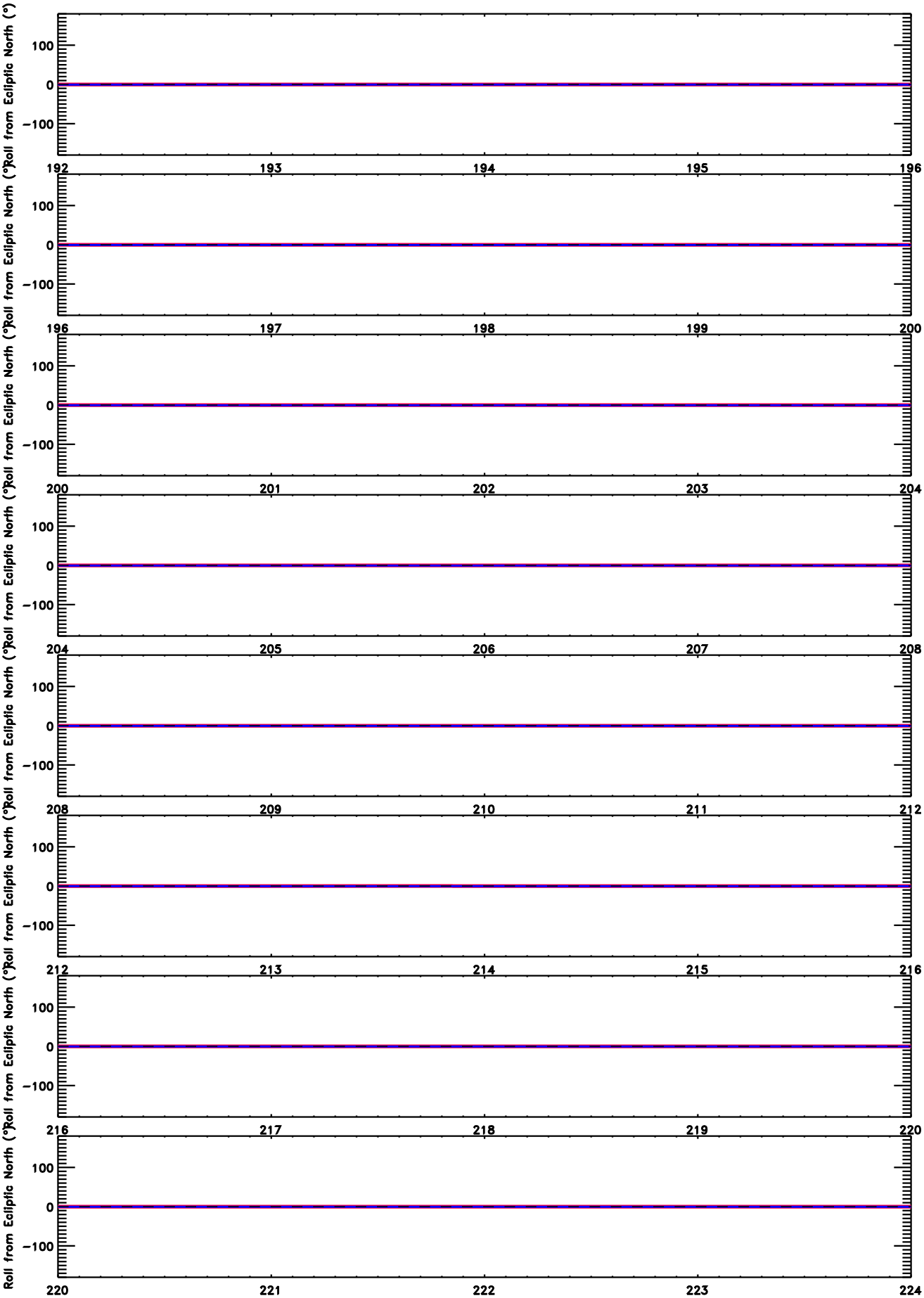
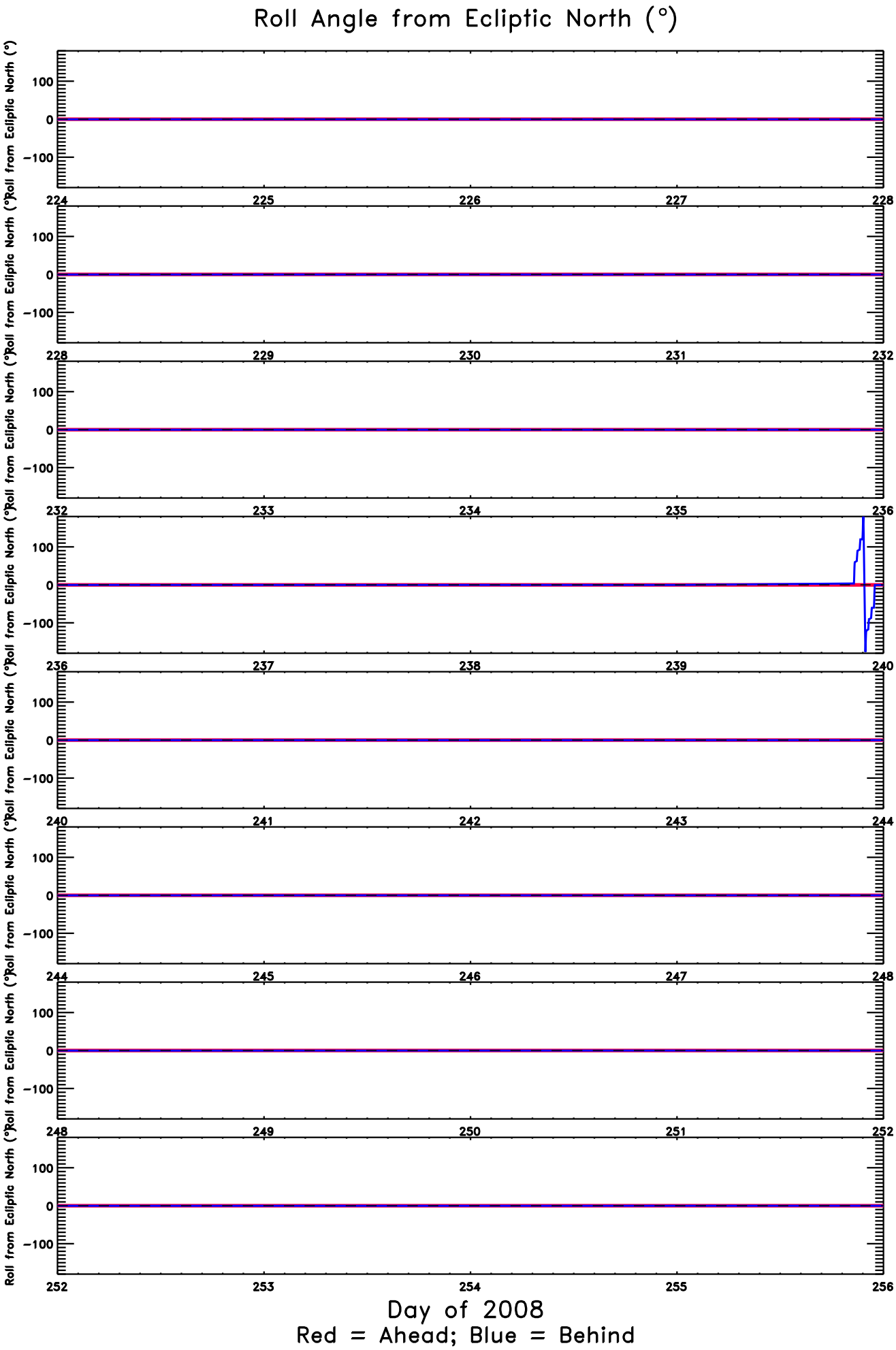
190
191
192
Day of 2008
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2008

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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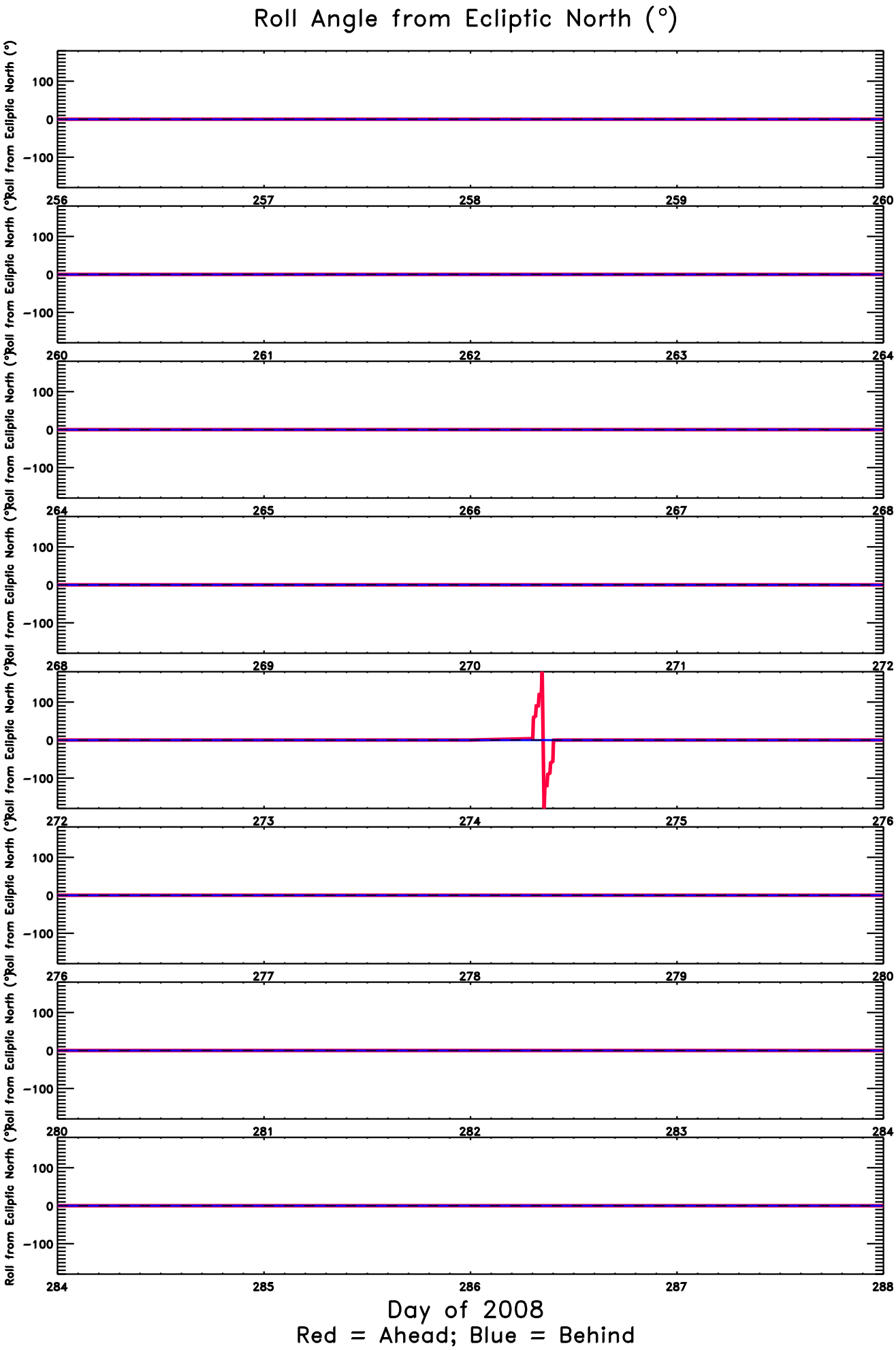
Day of 2008
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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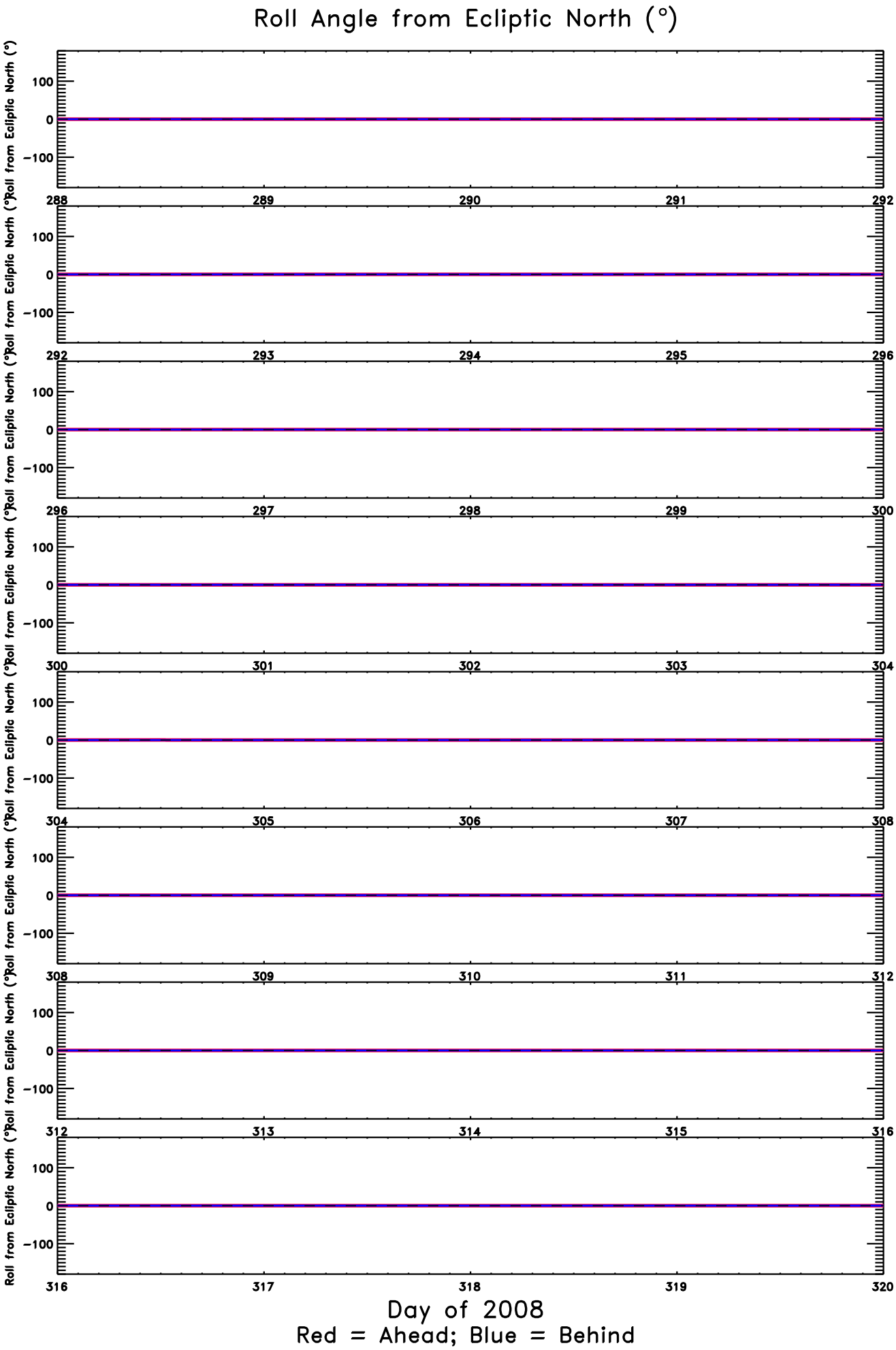
Day of 2008
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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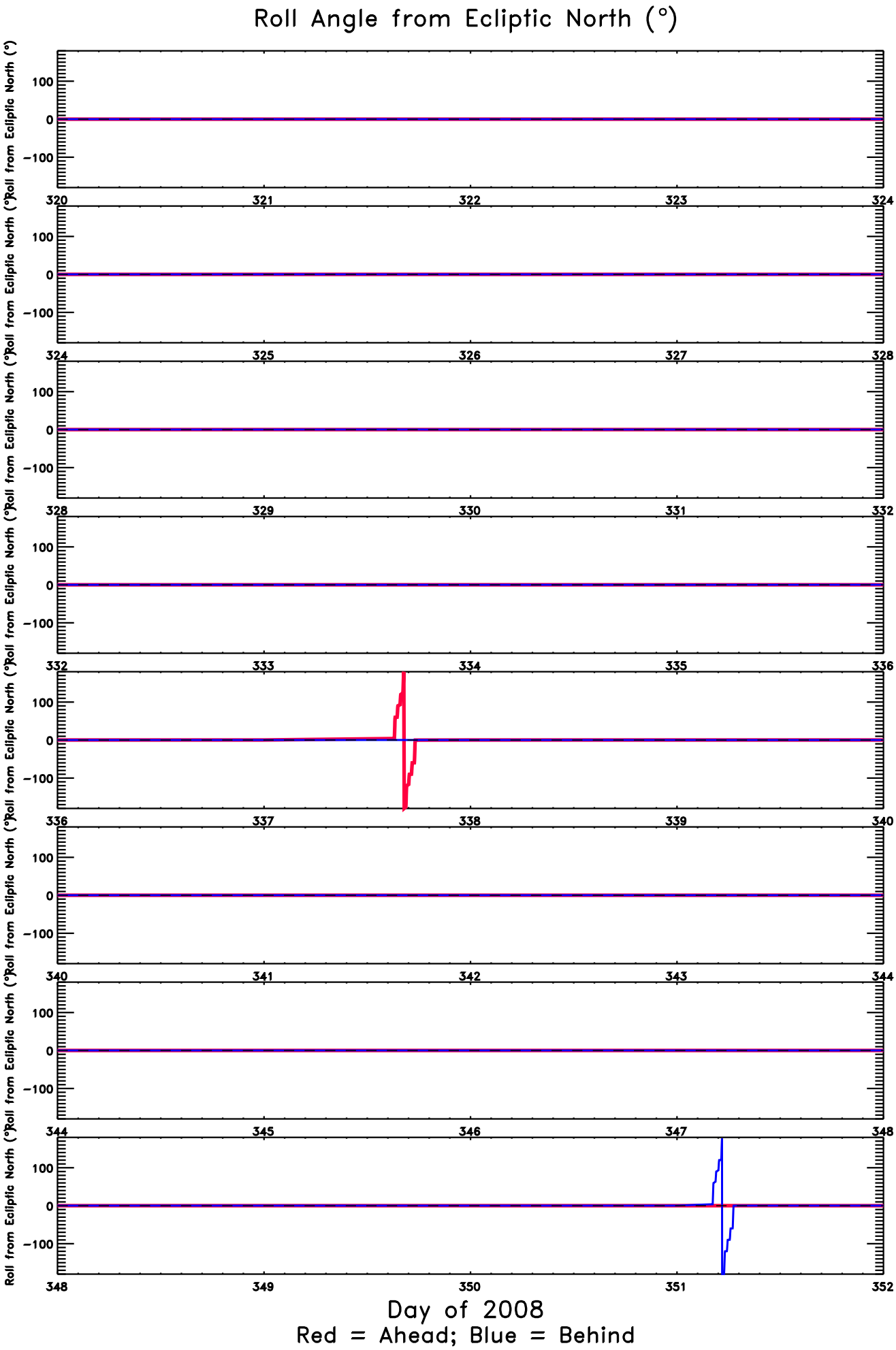
320
Day of 2008
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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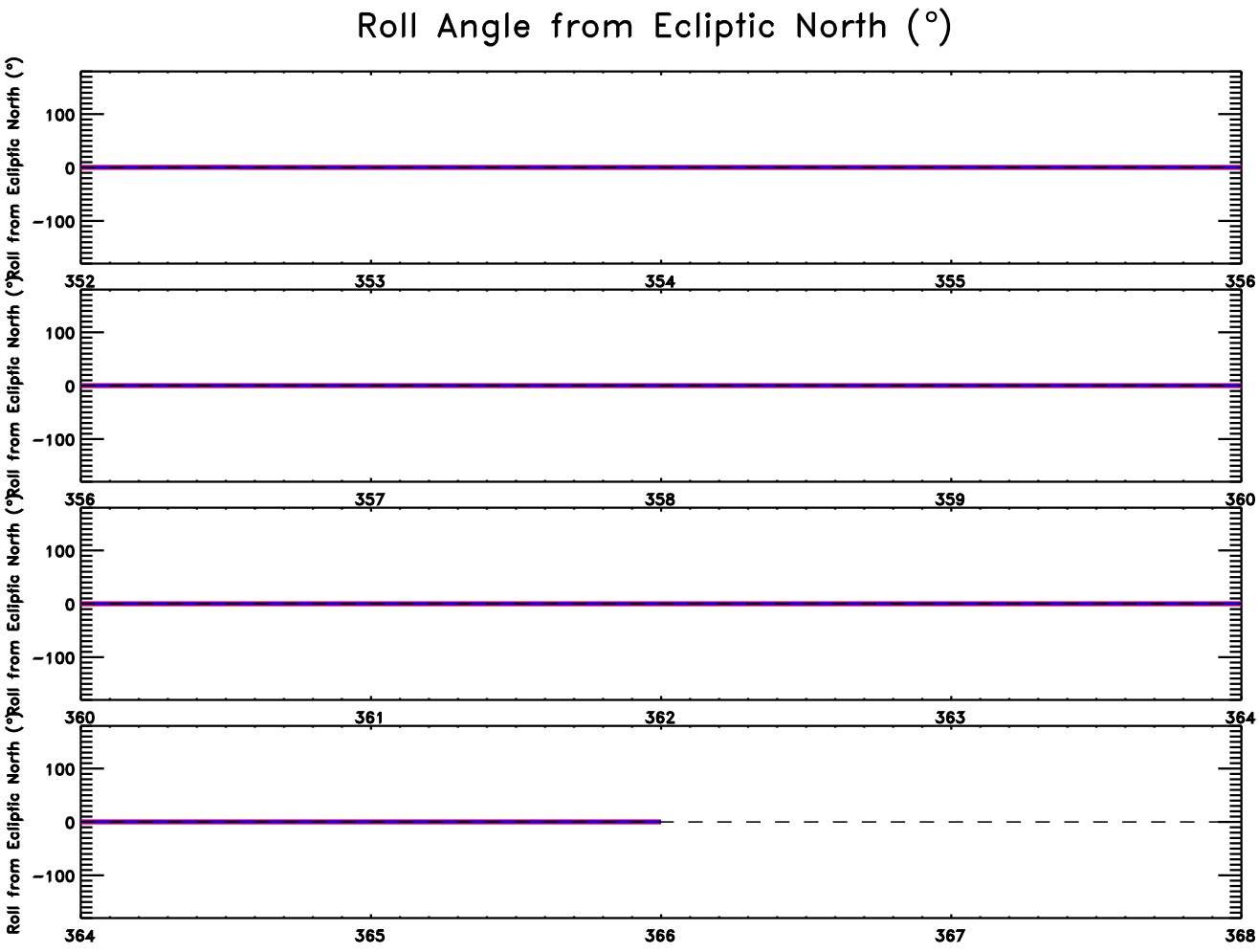
Day of 2008
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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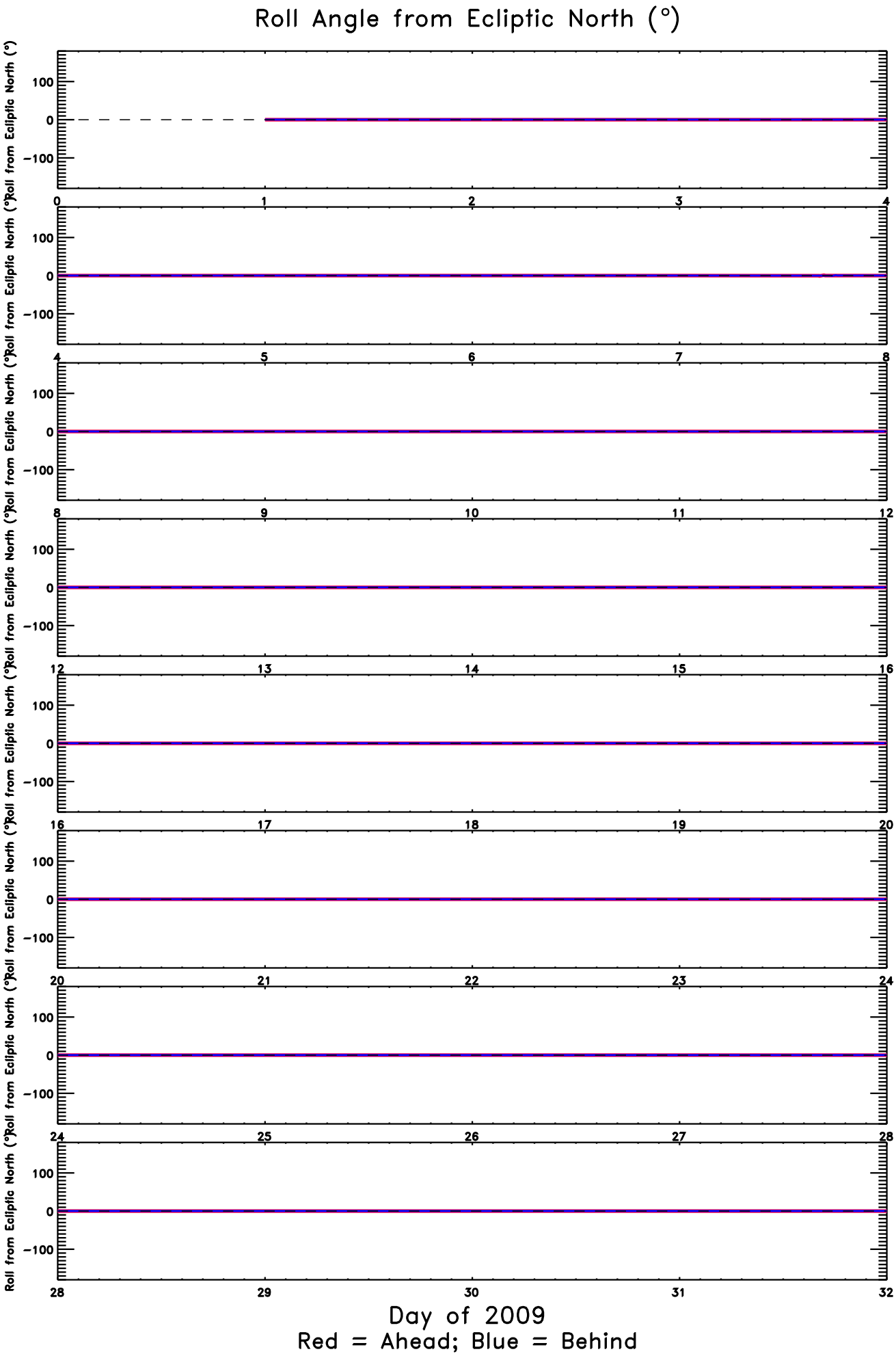
Day of 2008
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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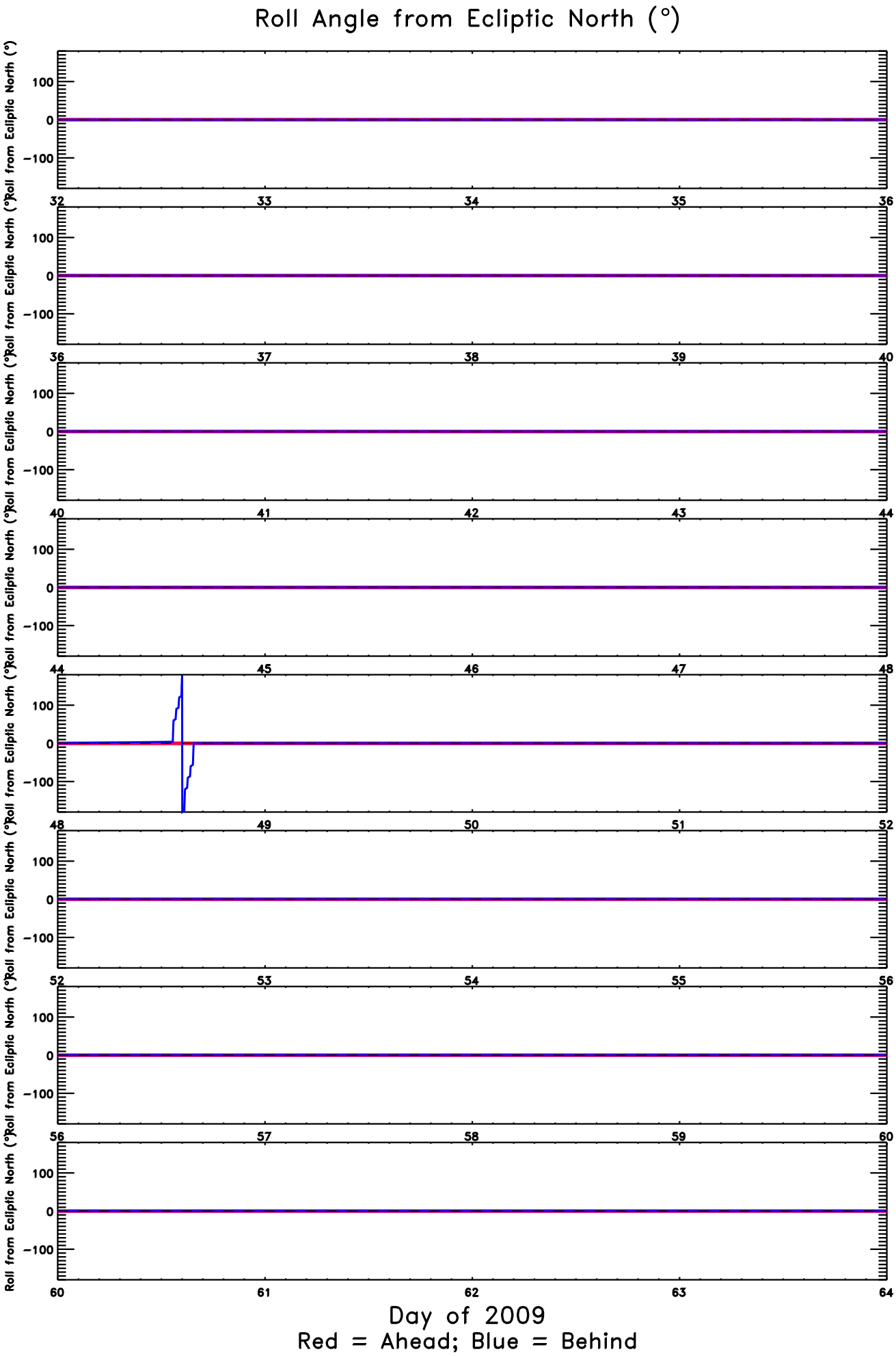
Day of 2009
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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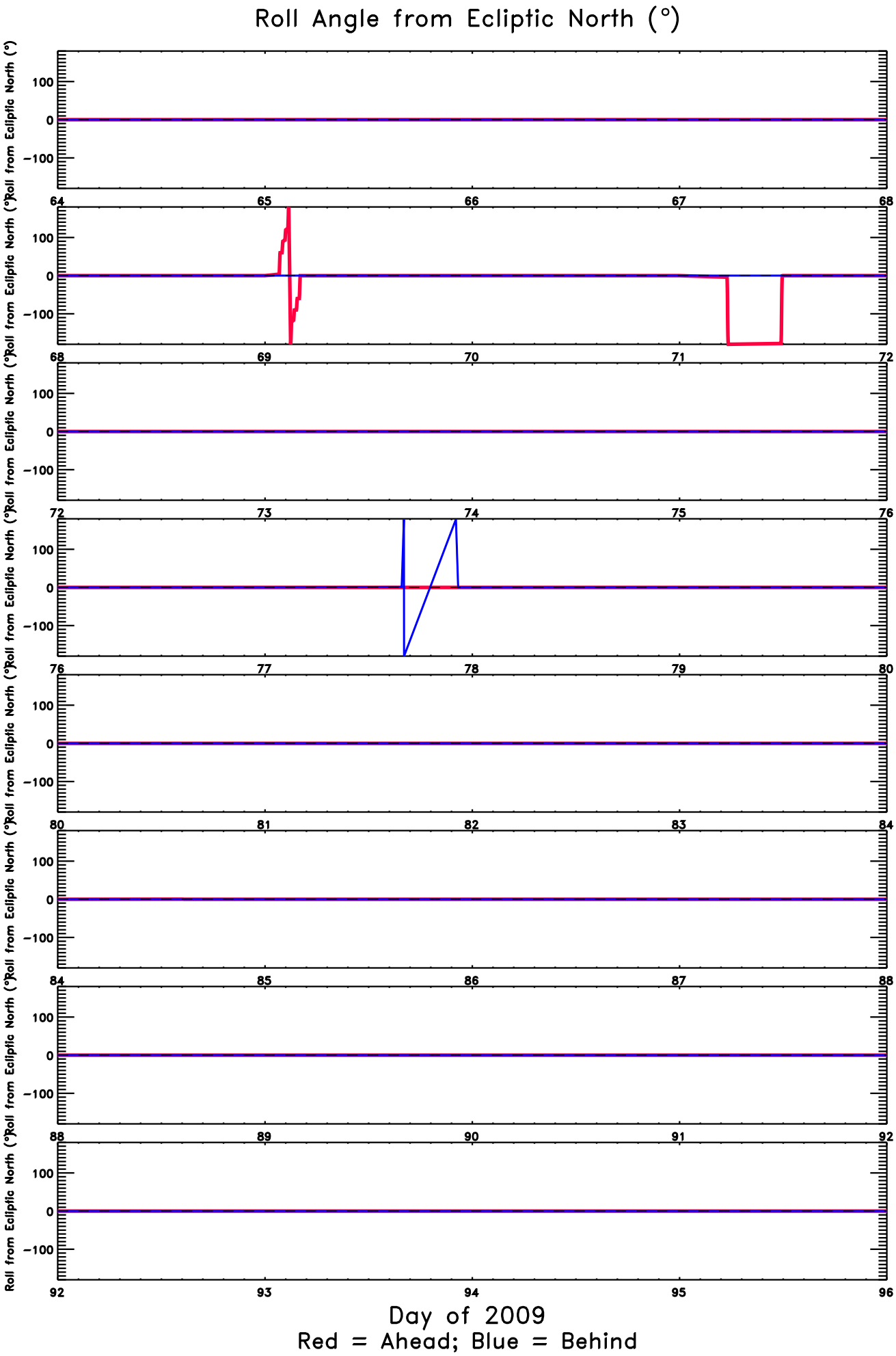
Day of 2009
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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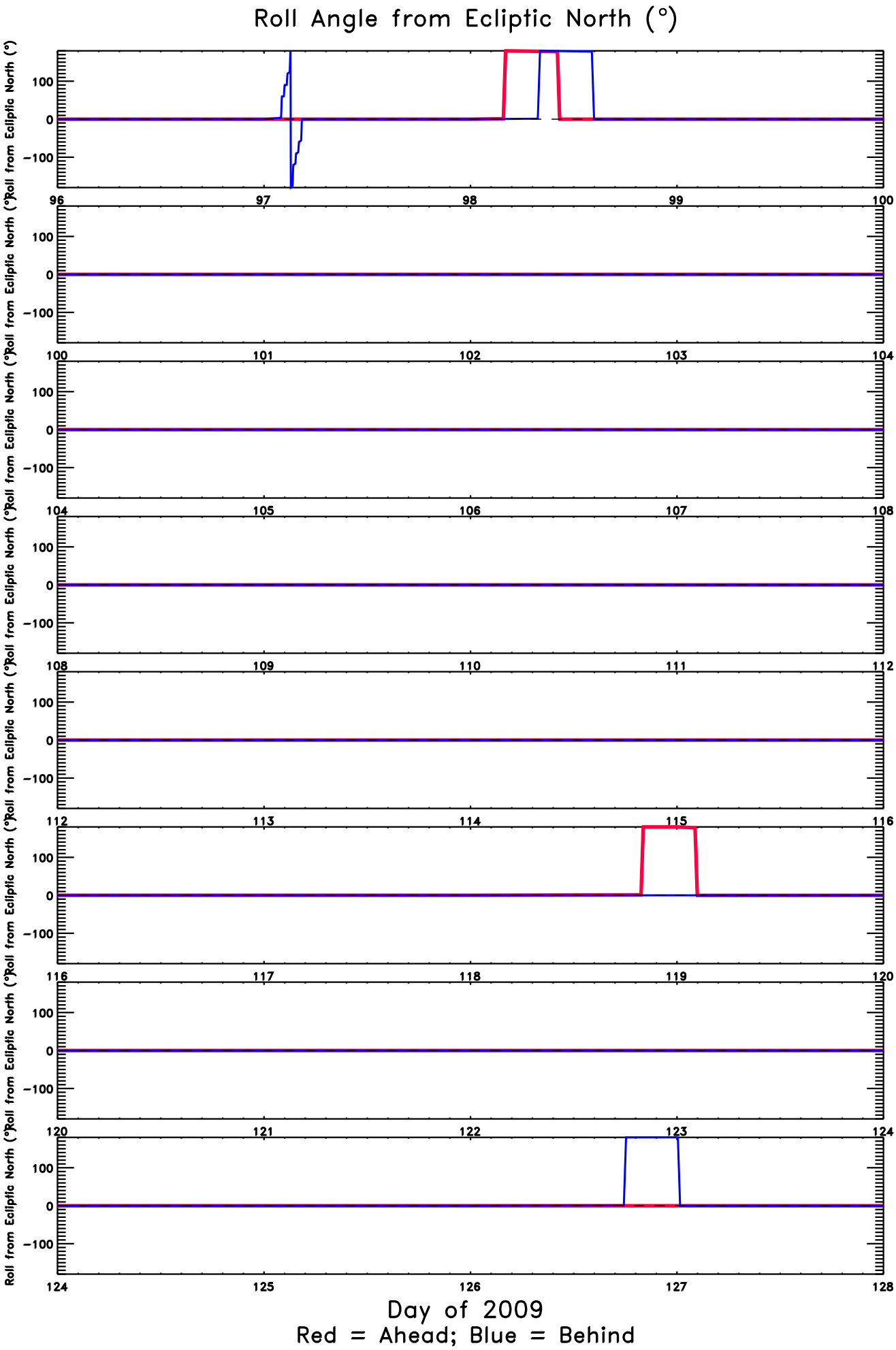
Day of 2009
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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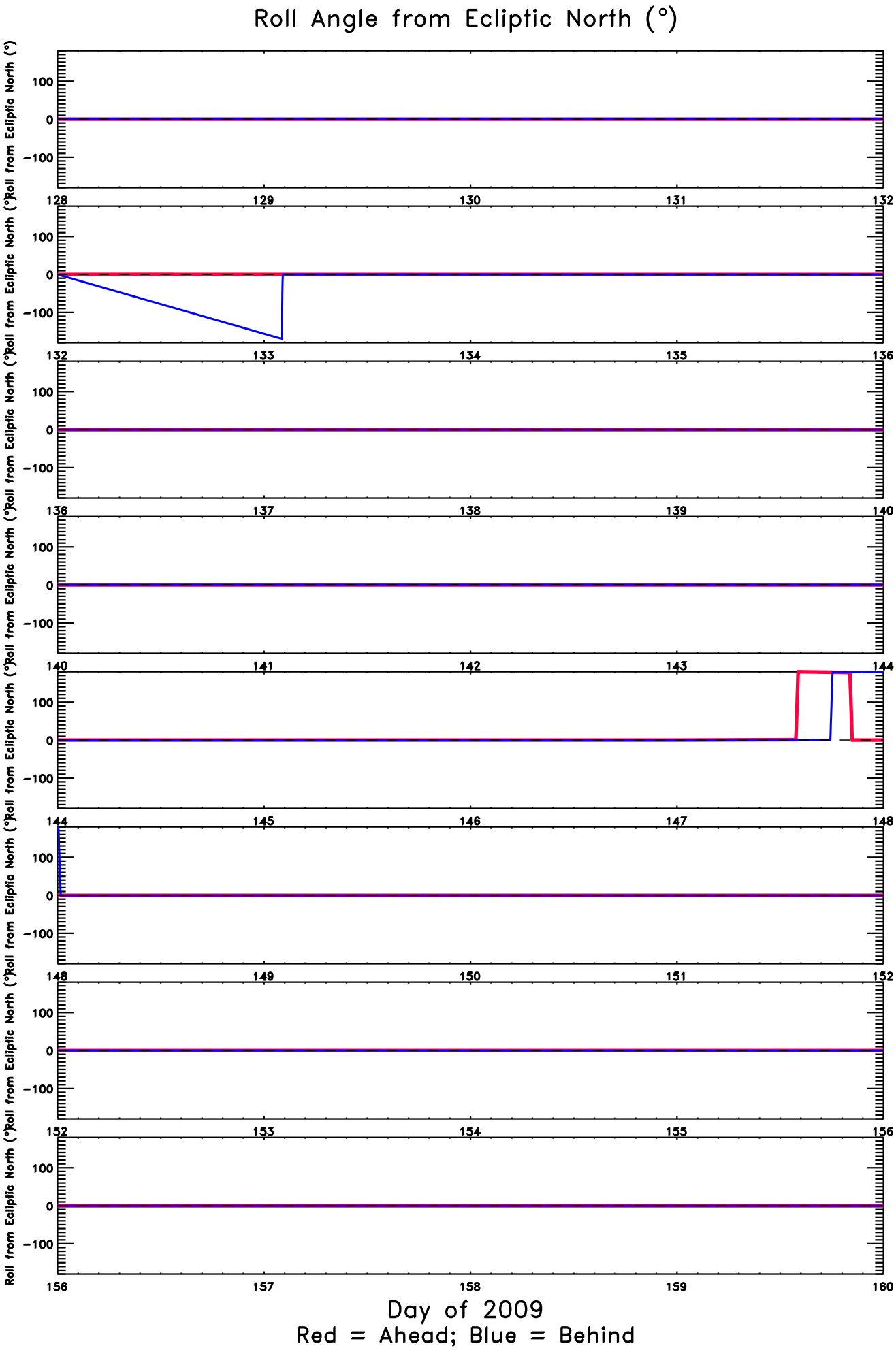
128
Day of 2009
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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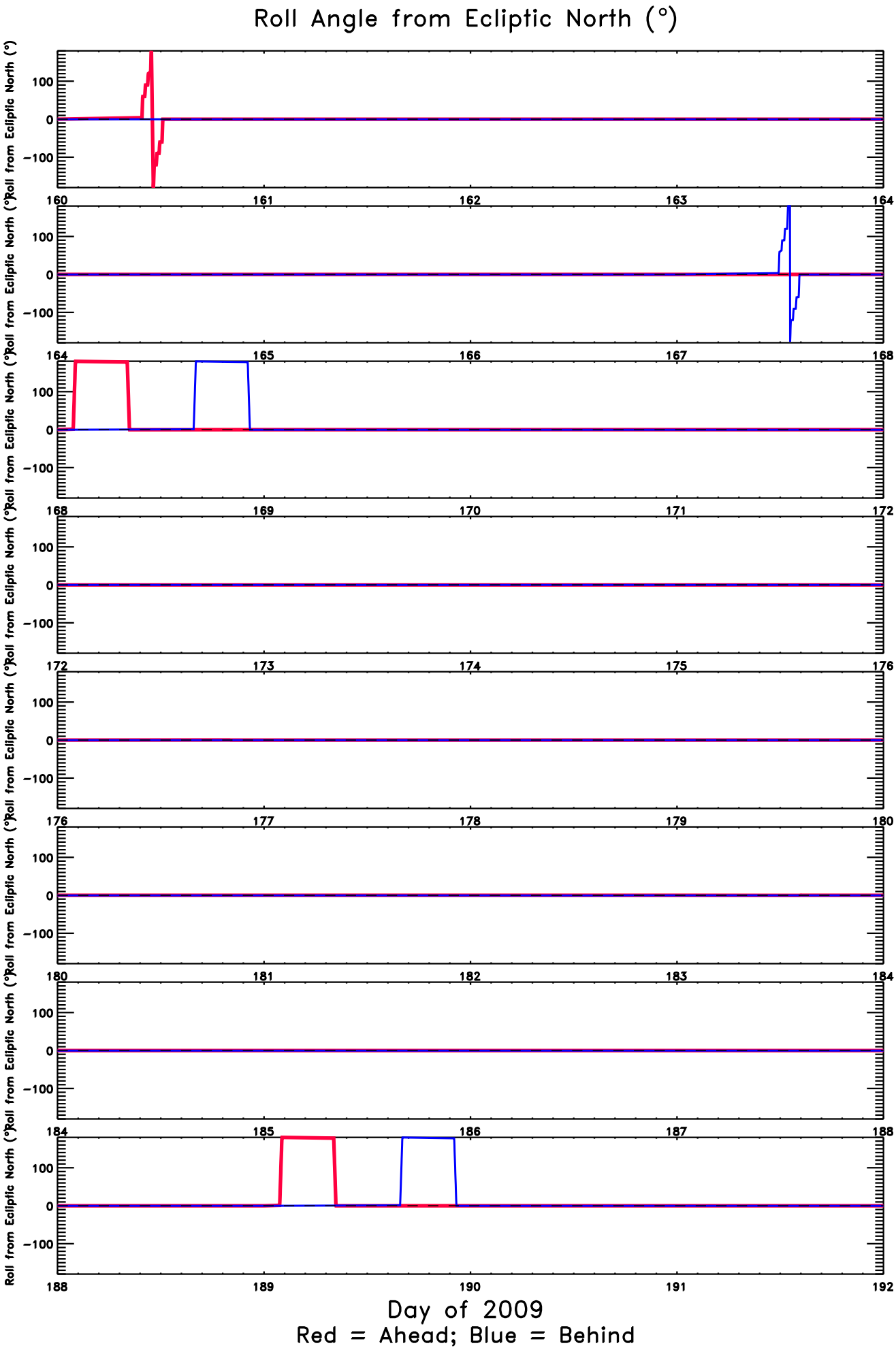
Day of 2009
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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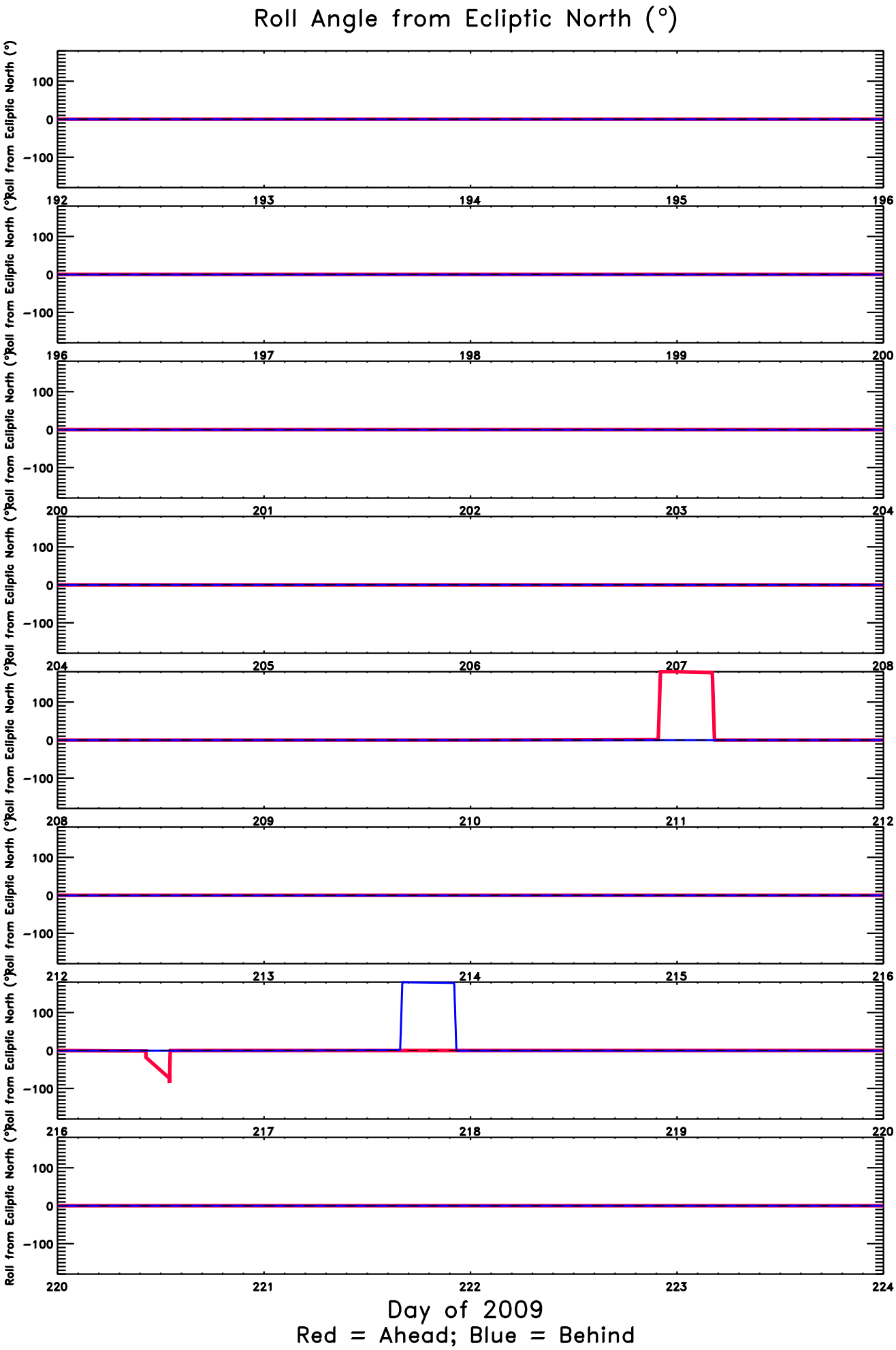
192
Day of 2009
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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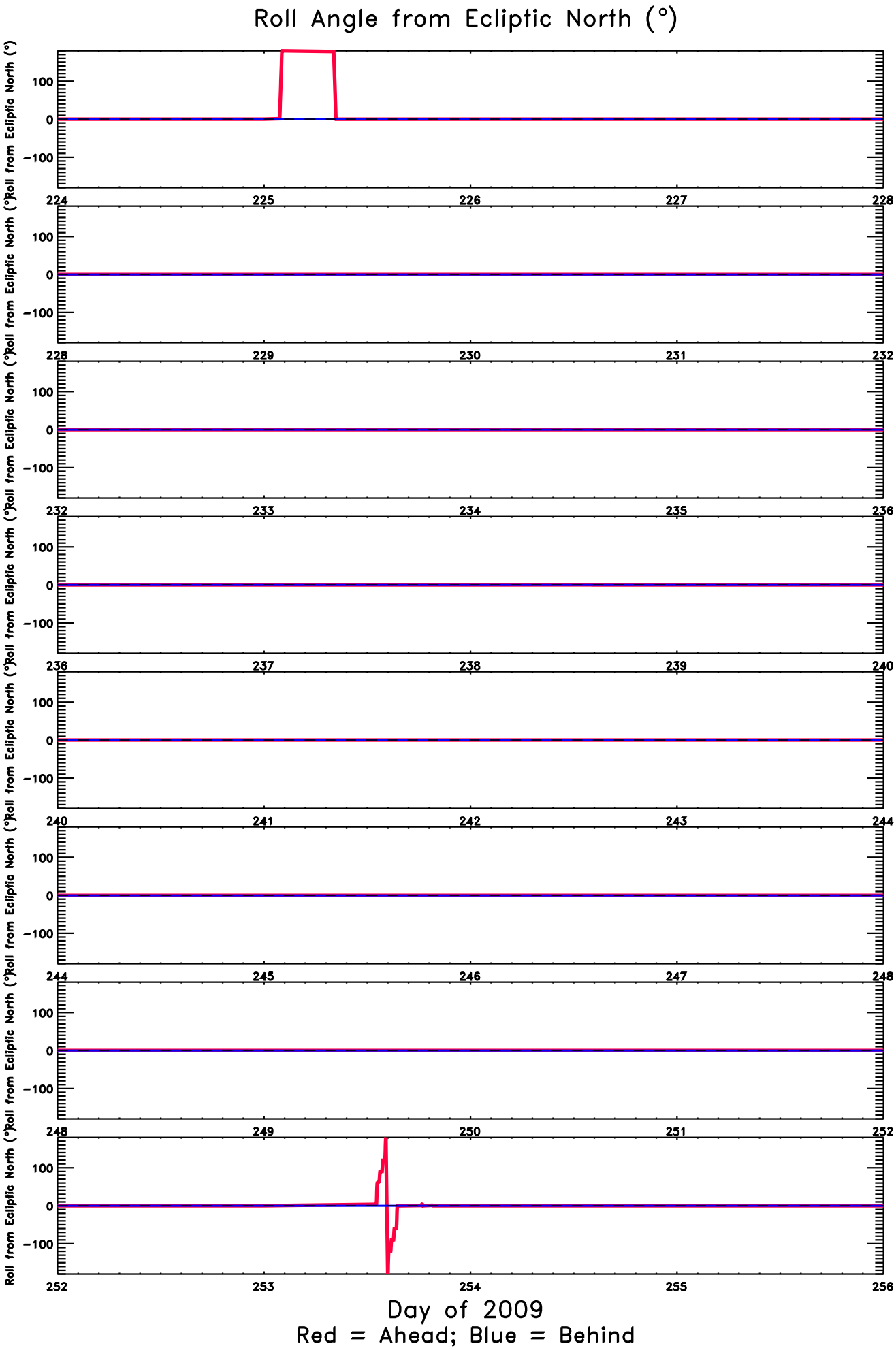
Day of 2009
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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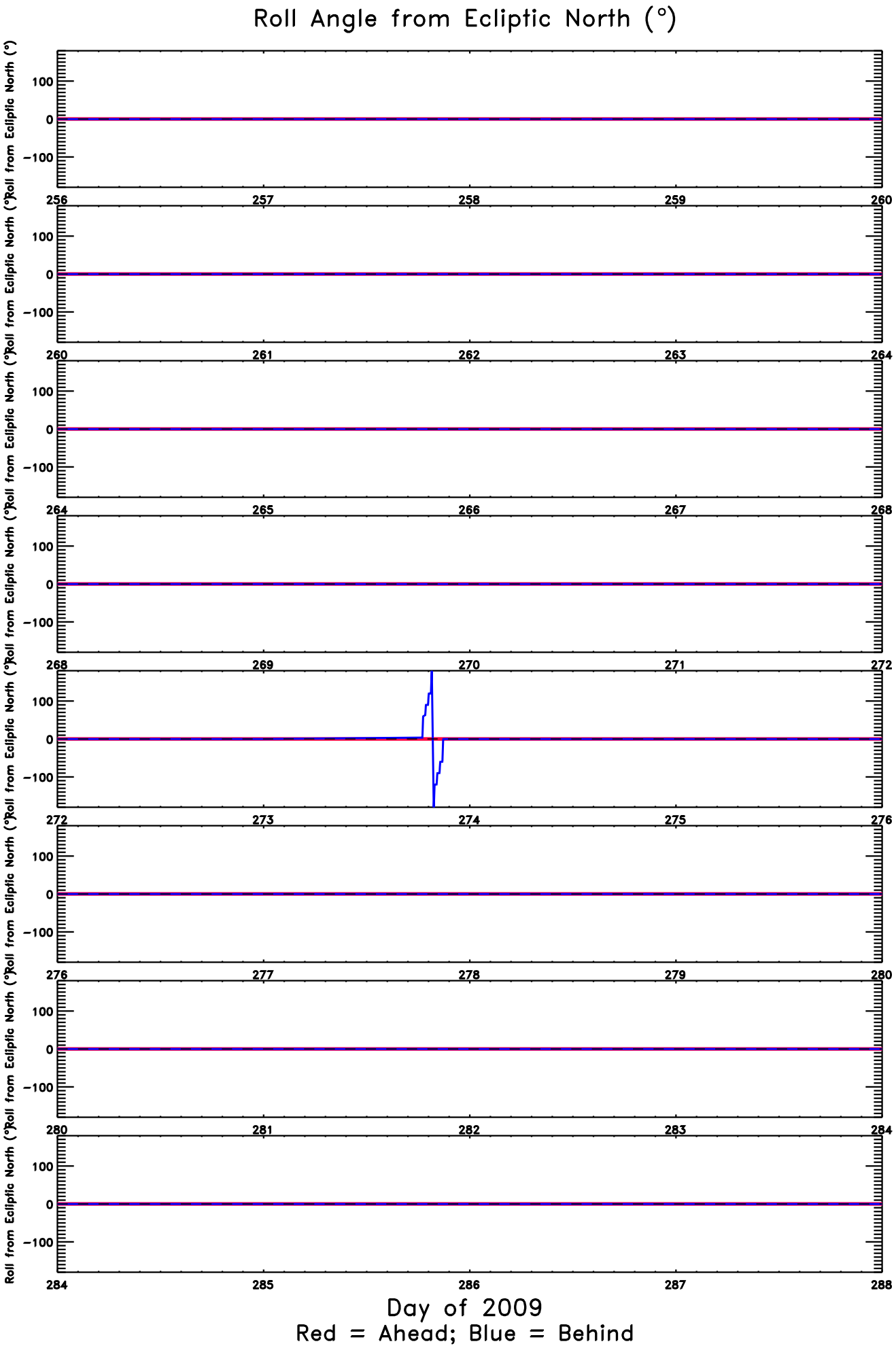
Day of 2009
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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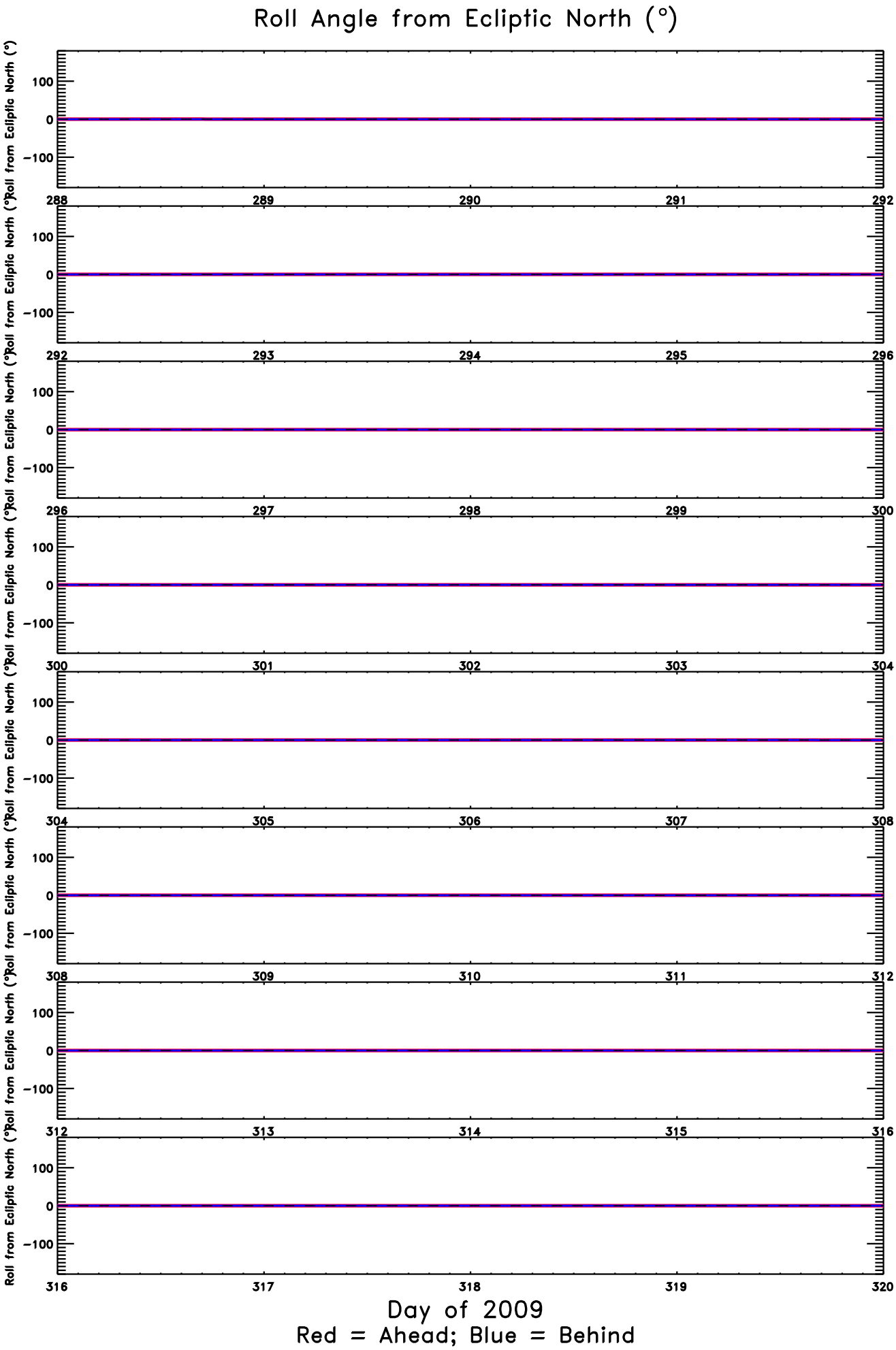
Day of 2009
Red = Ahead; Blue = Behind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Roll from Ecliptic North (°)
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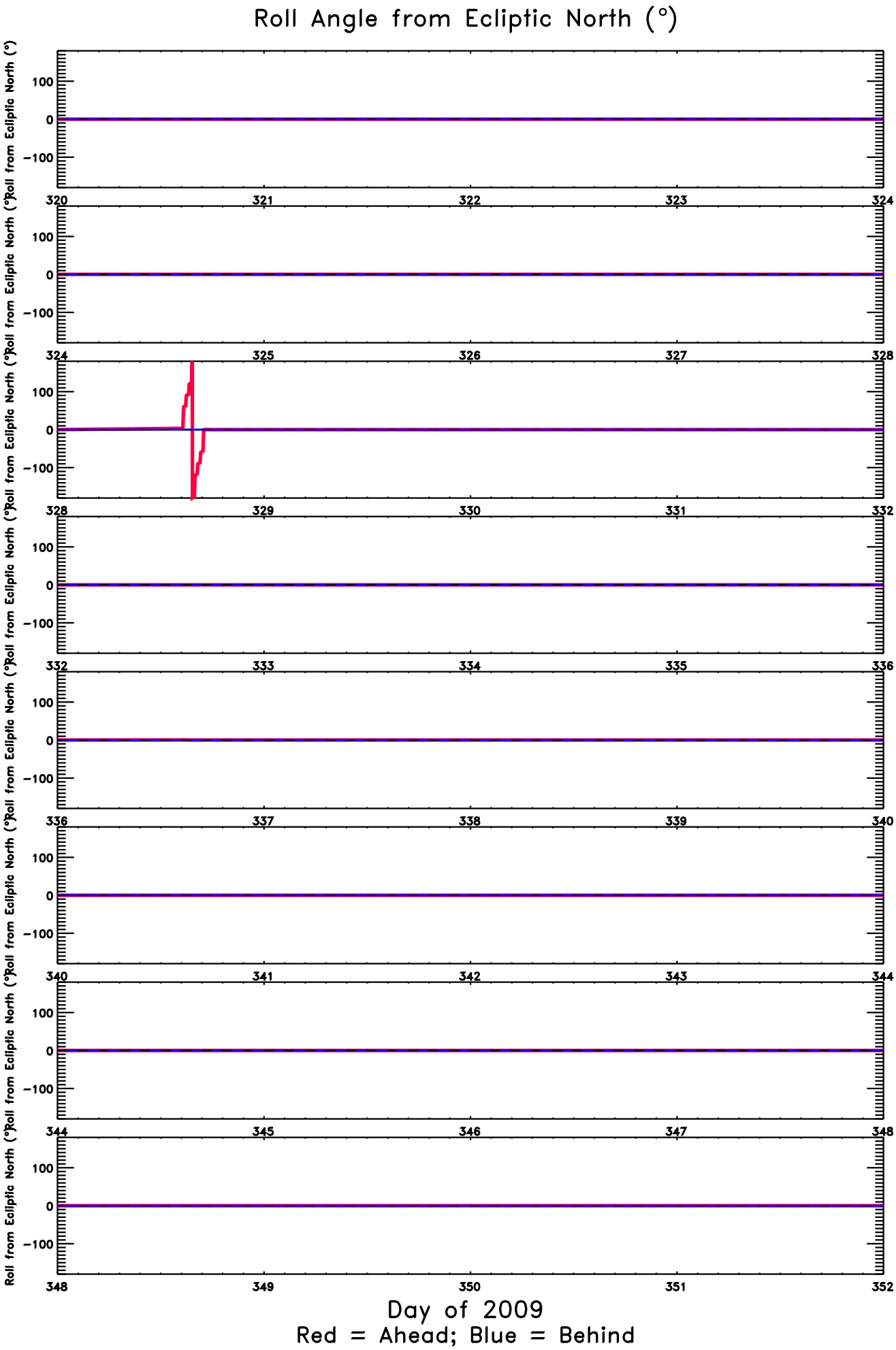
Day of 2009
Red = Ahead; Blue = Behind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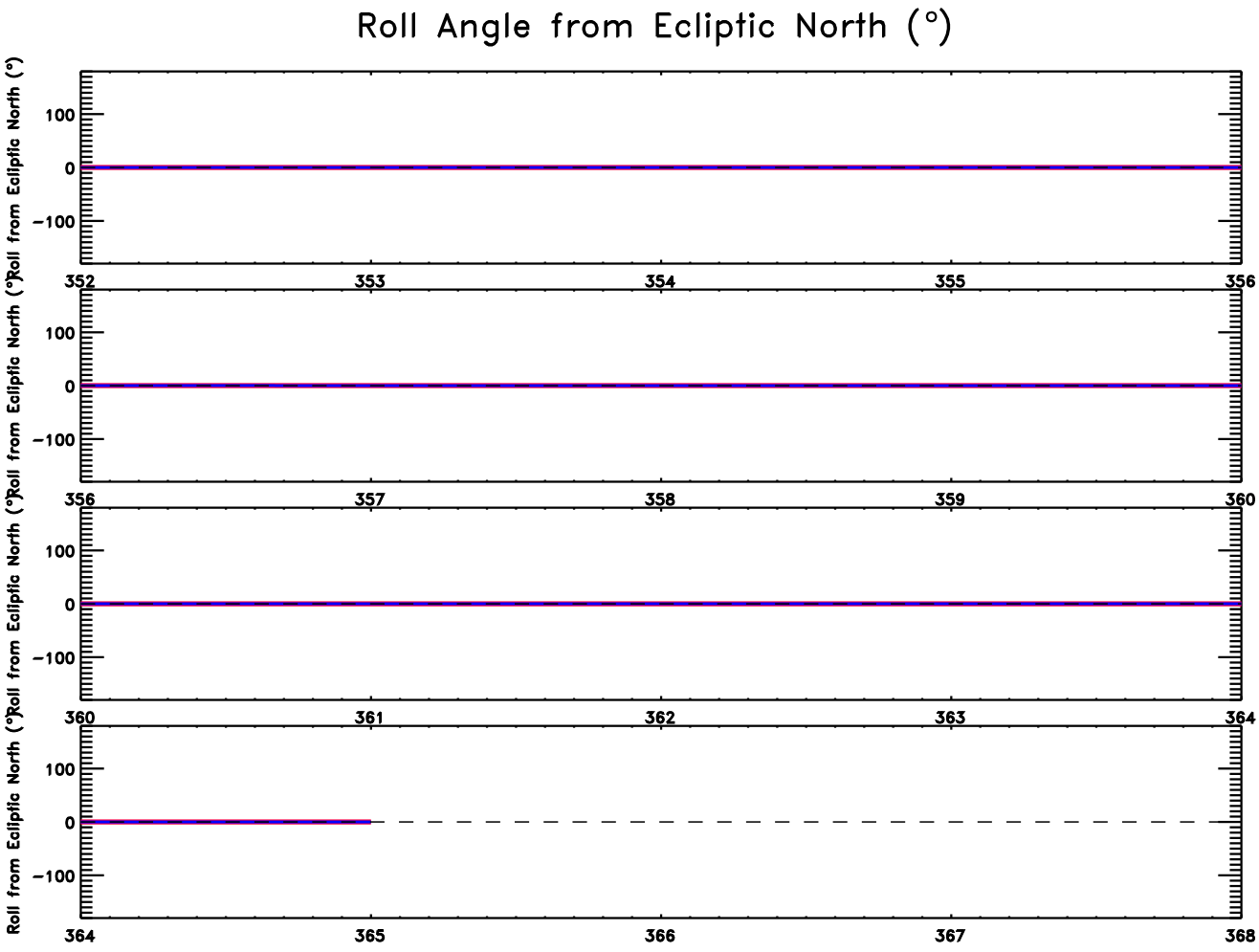
Day of 2009
Red = Ahead; Blue = Behind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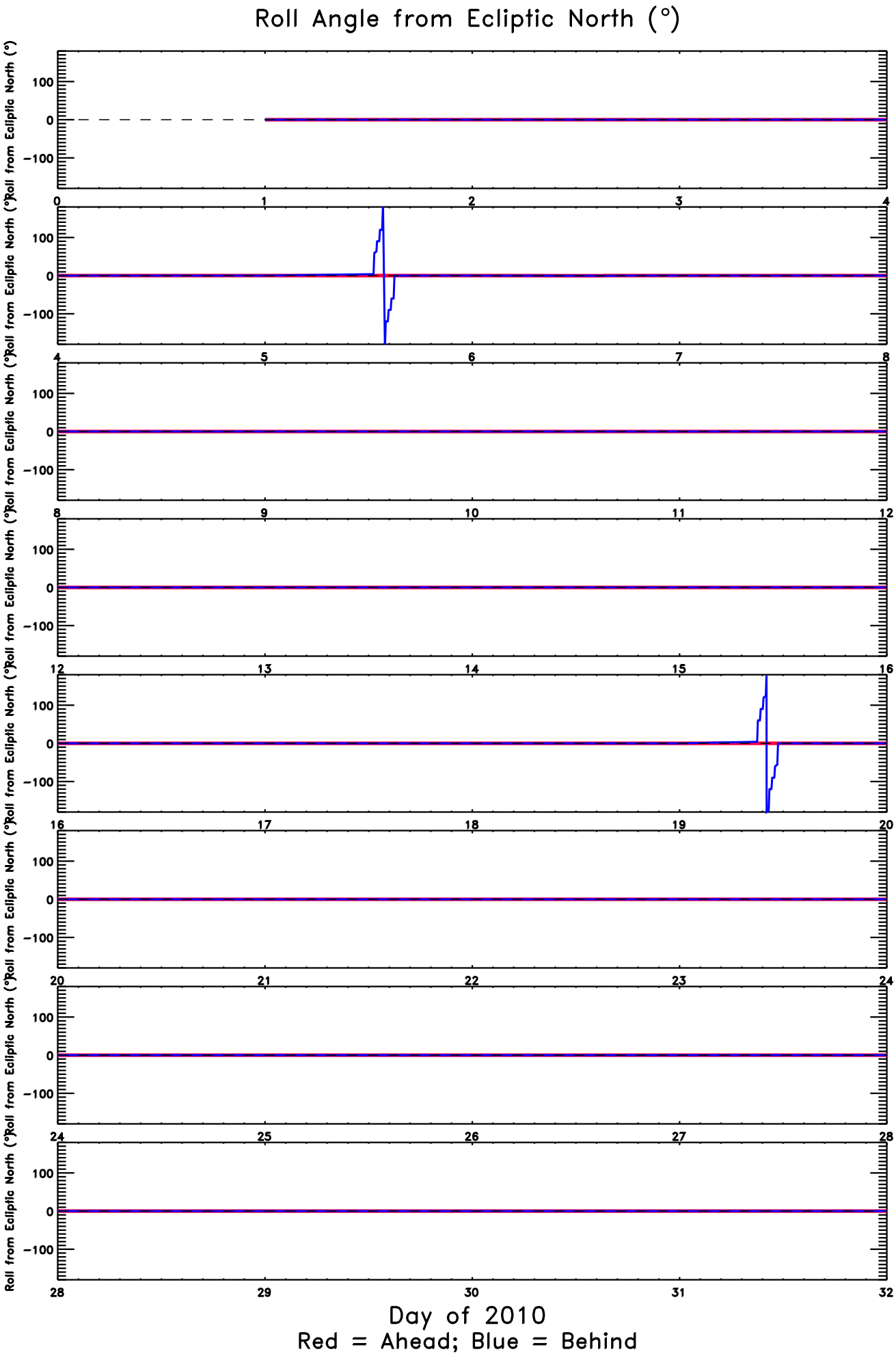
Day of 2009
Red = Ahead; Blue = Behind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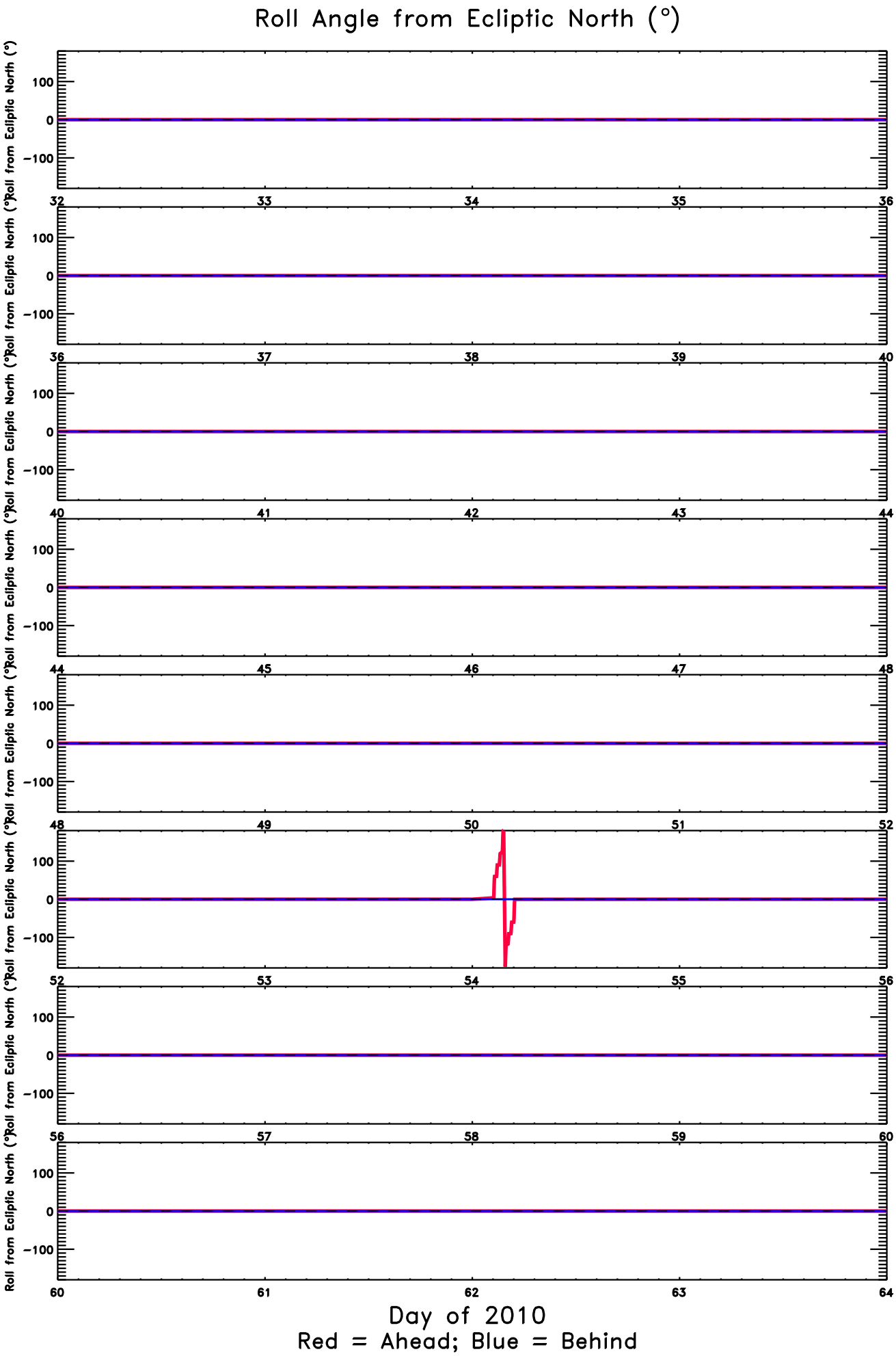
Day of 2010
Red = Ahead; Blue = Behind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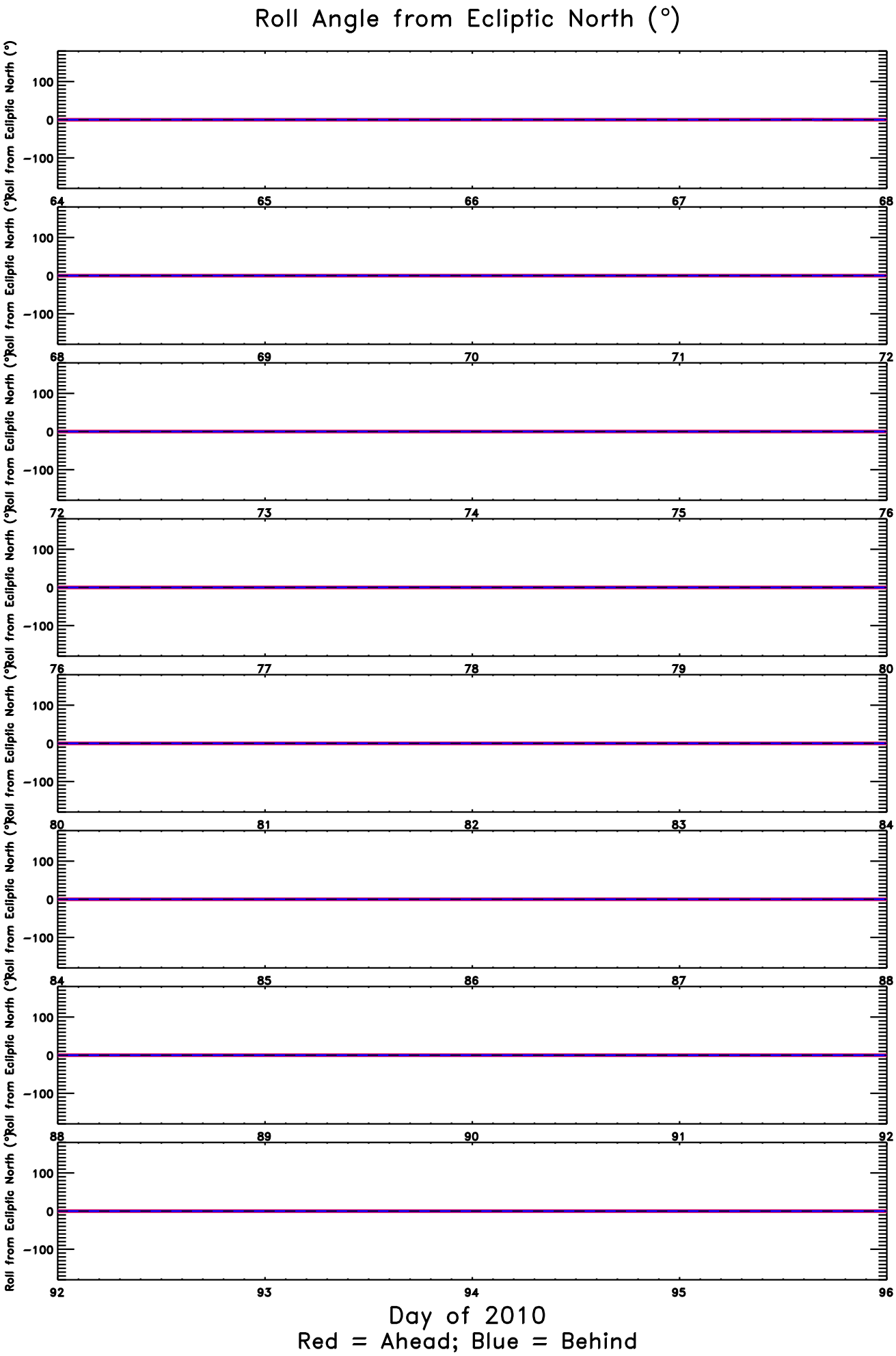
Day of 2010
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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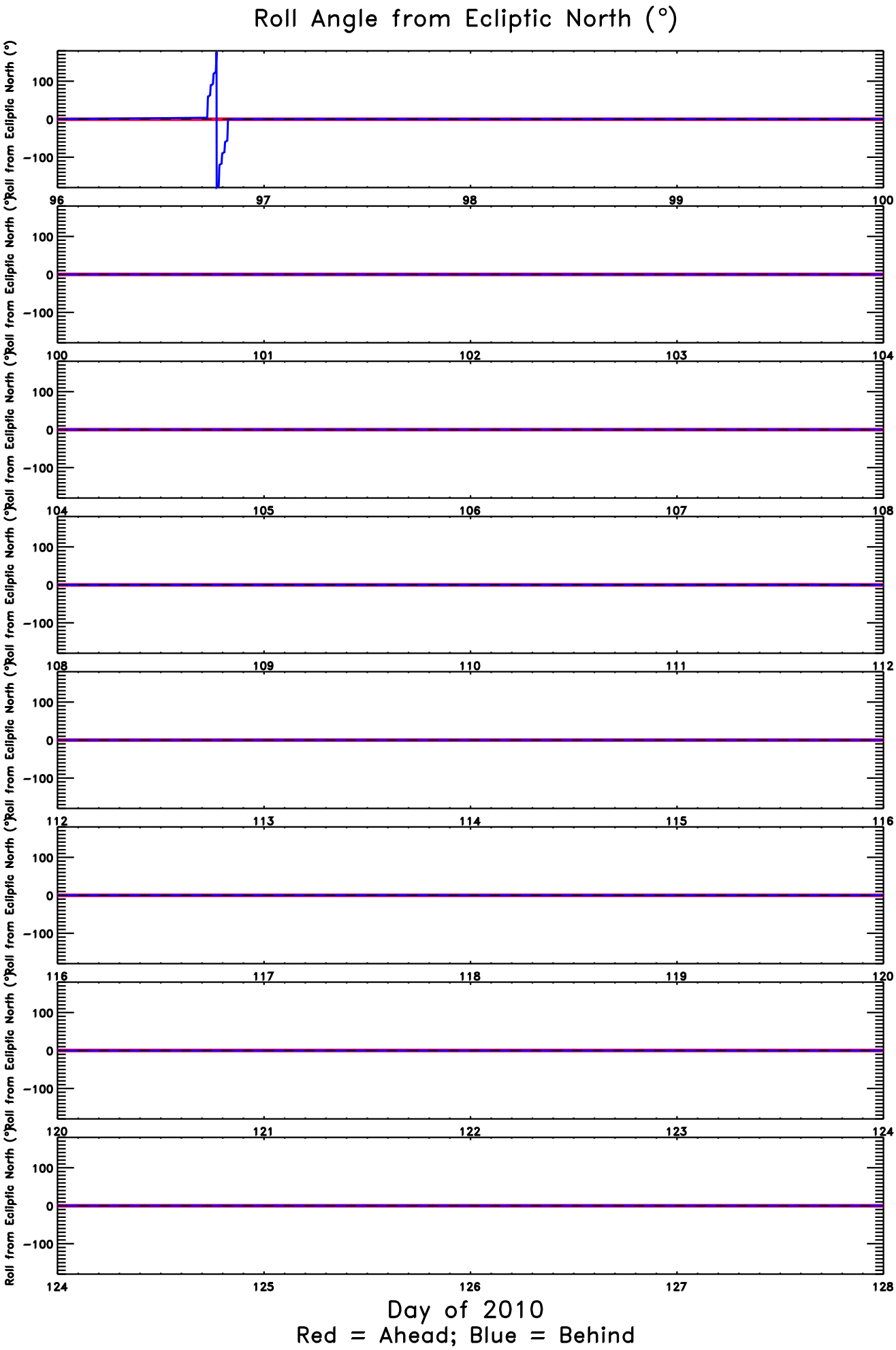
Day of 2010
Red = Ahead; Blue = Behind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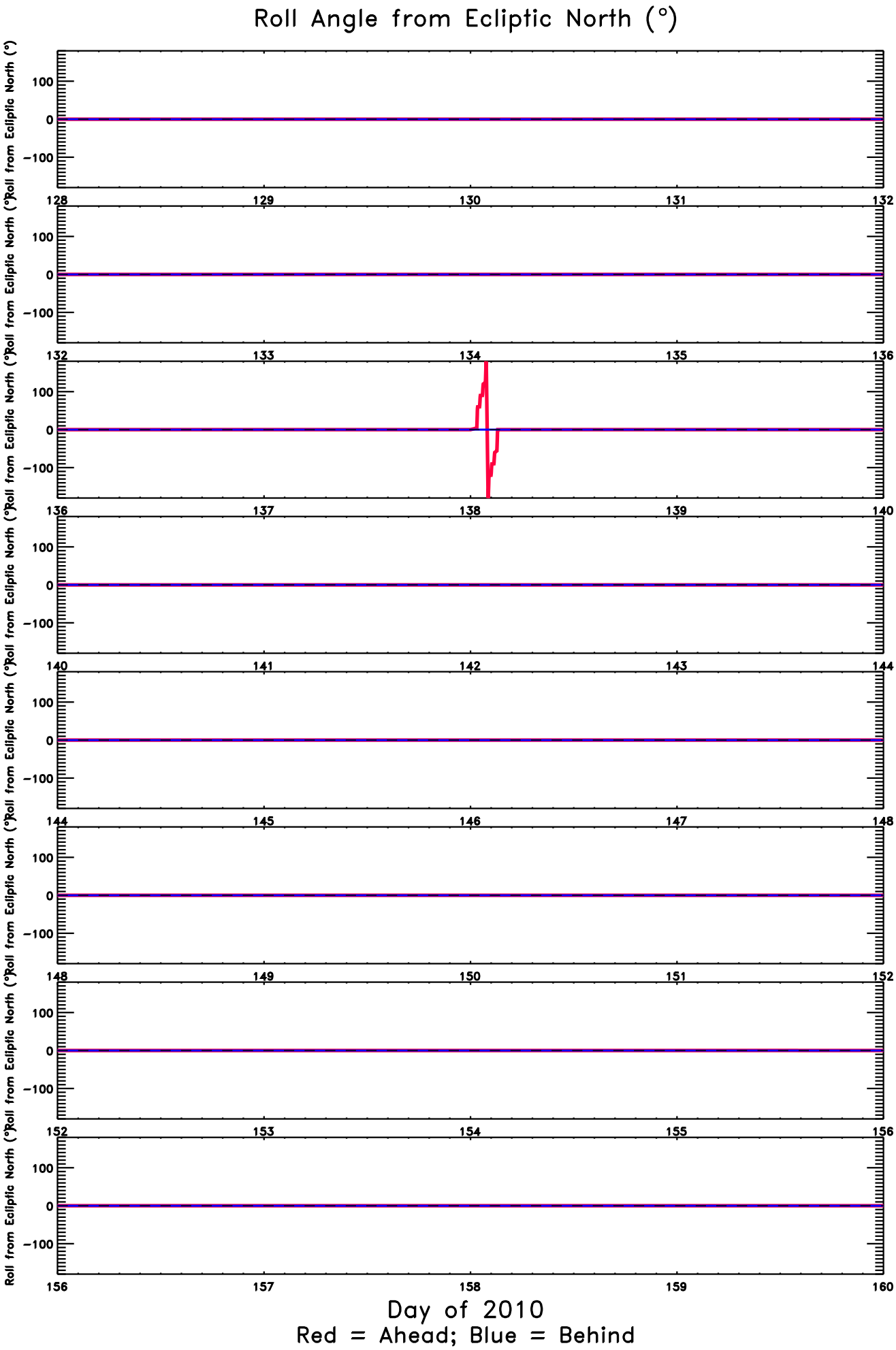
Day of 2010
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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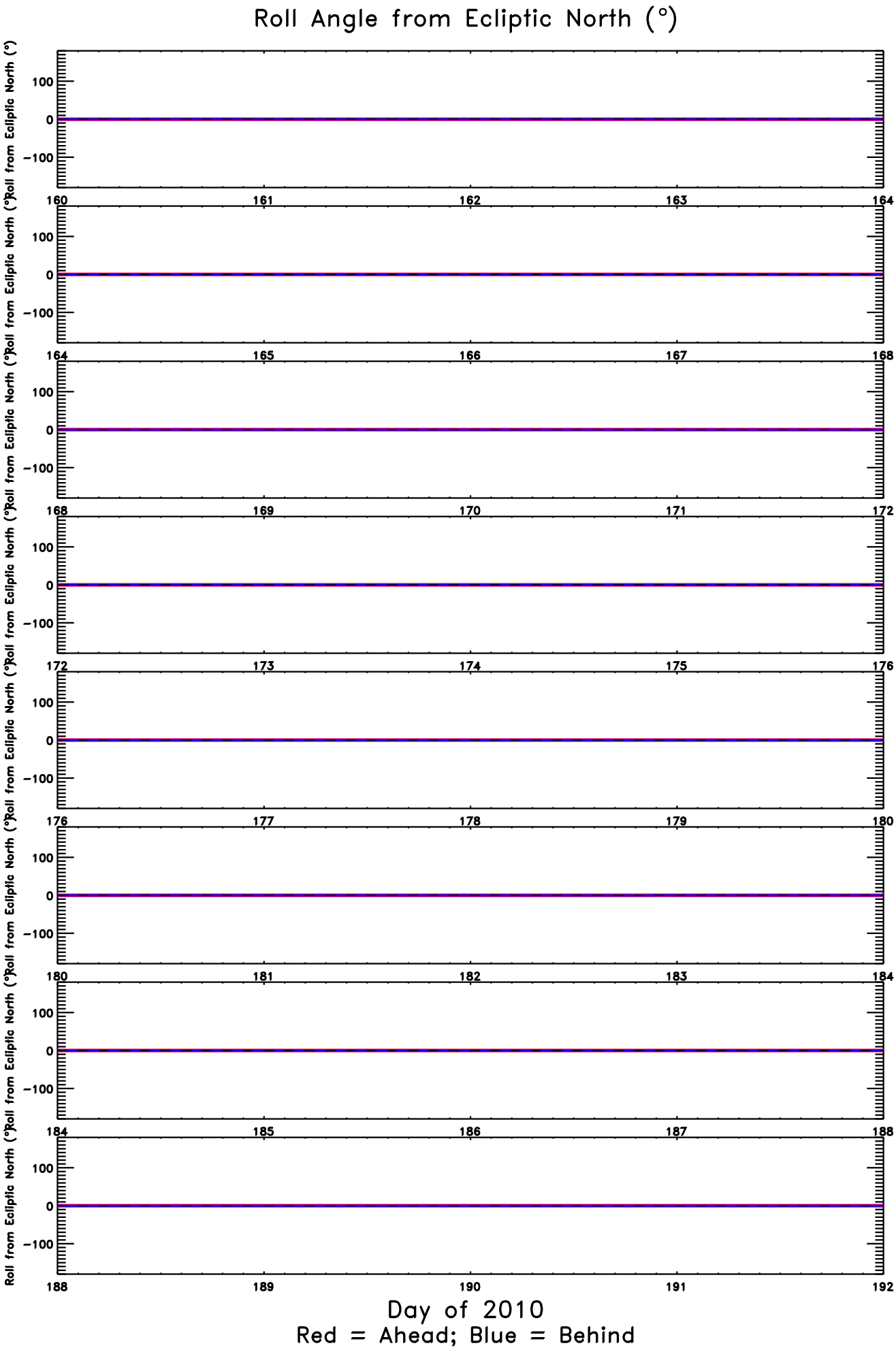
Day of 2010
Red = Ahead; Blue = Behind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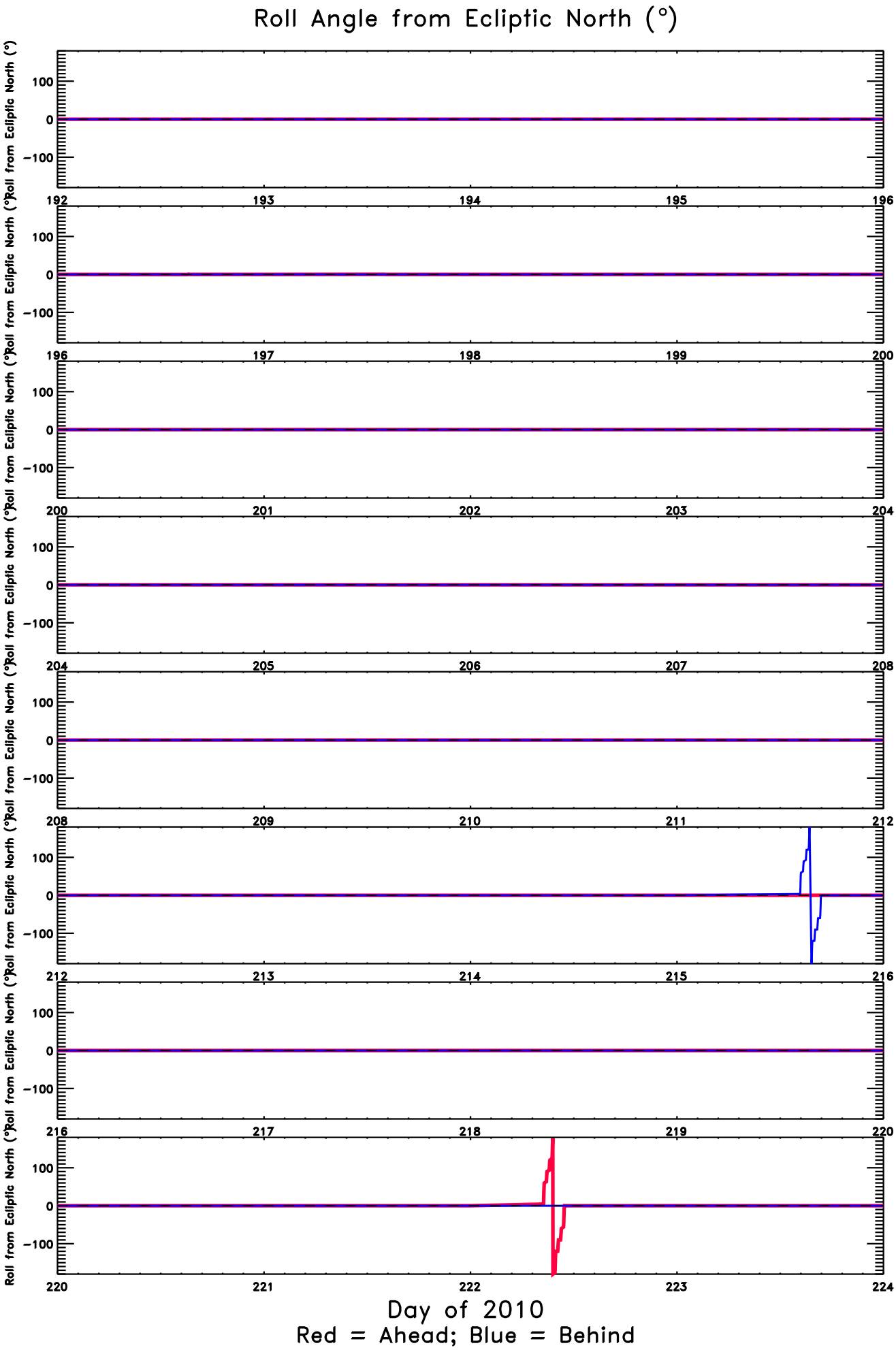
Day of 2010
Red = Ahead; Blue = Behind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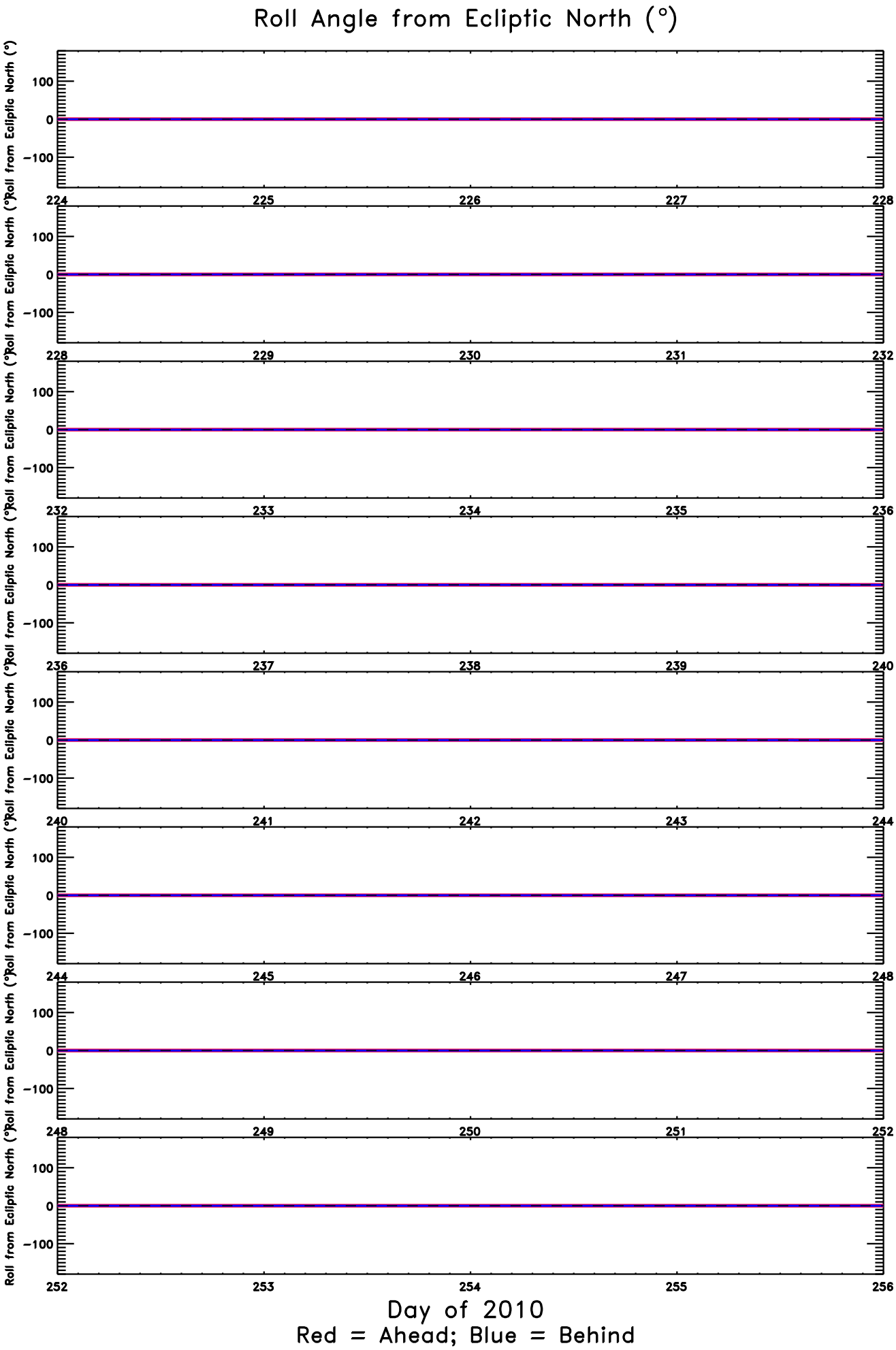
Day of 2010
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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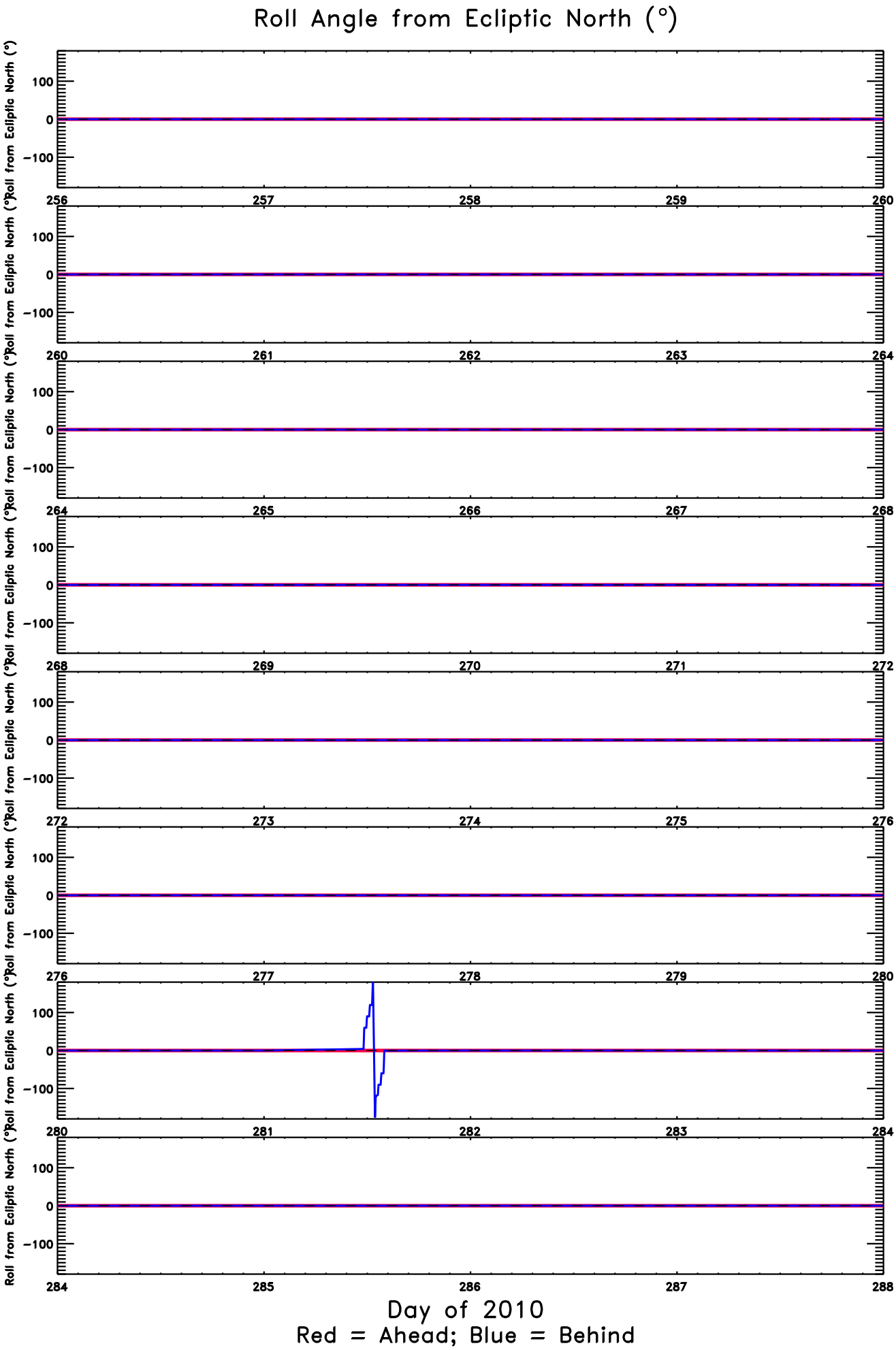
Day of 2010
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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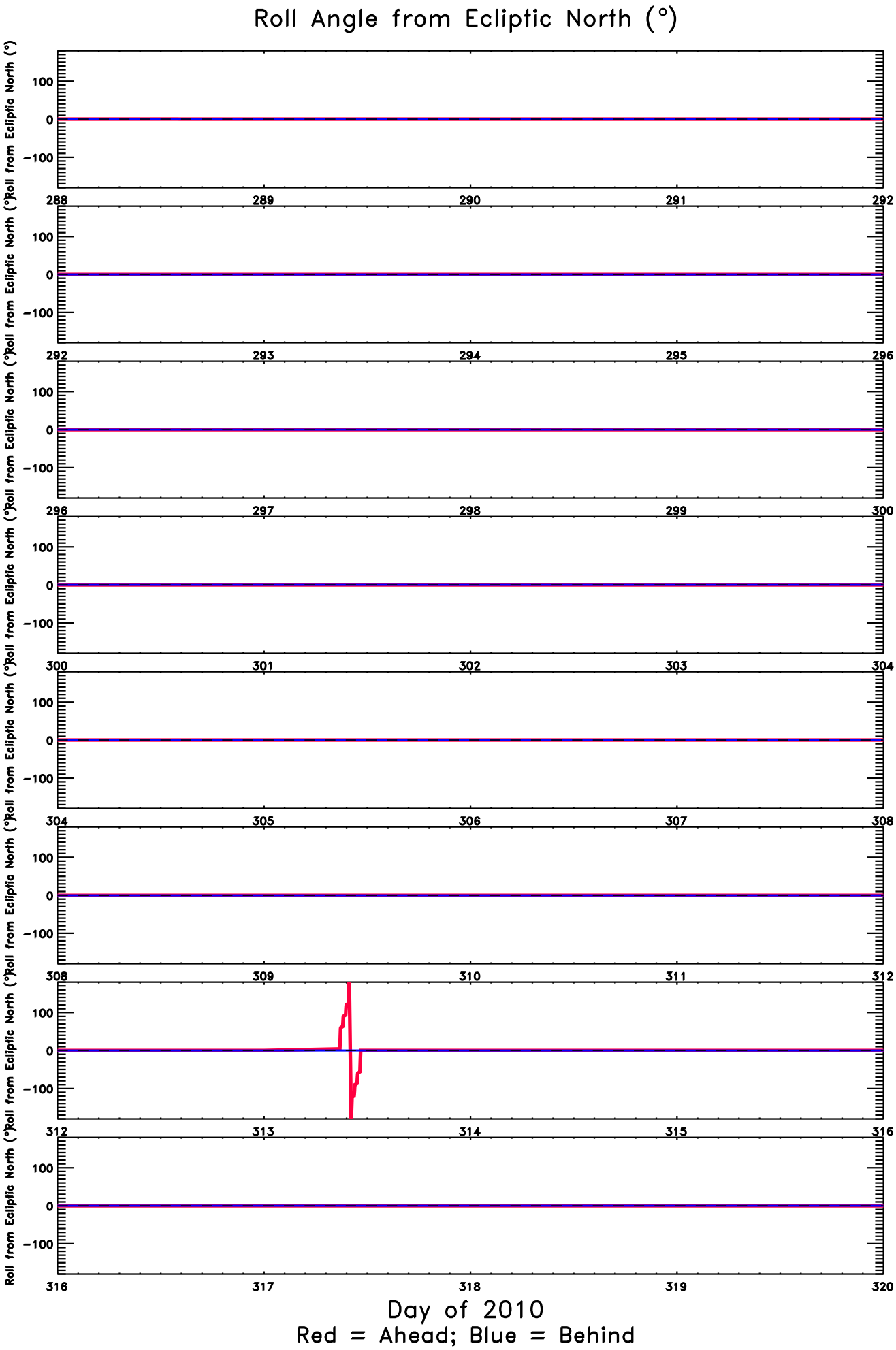
Day of 2010
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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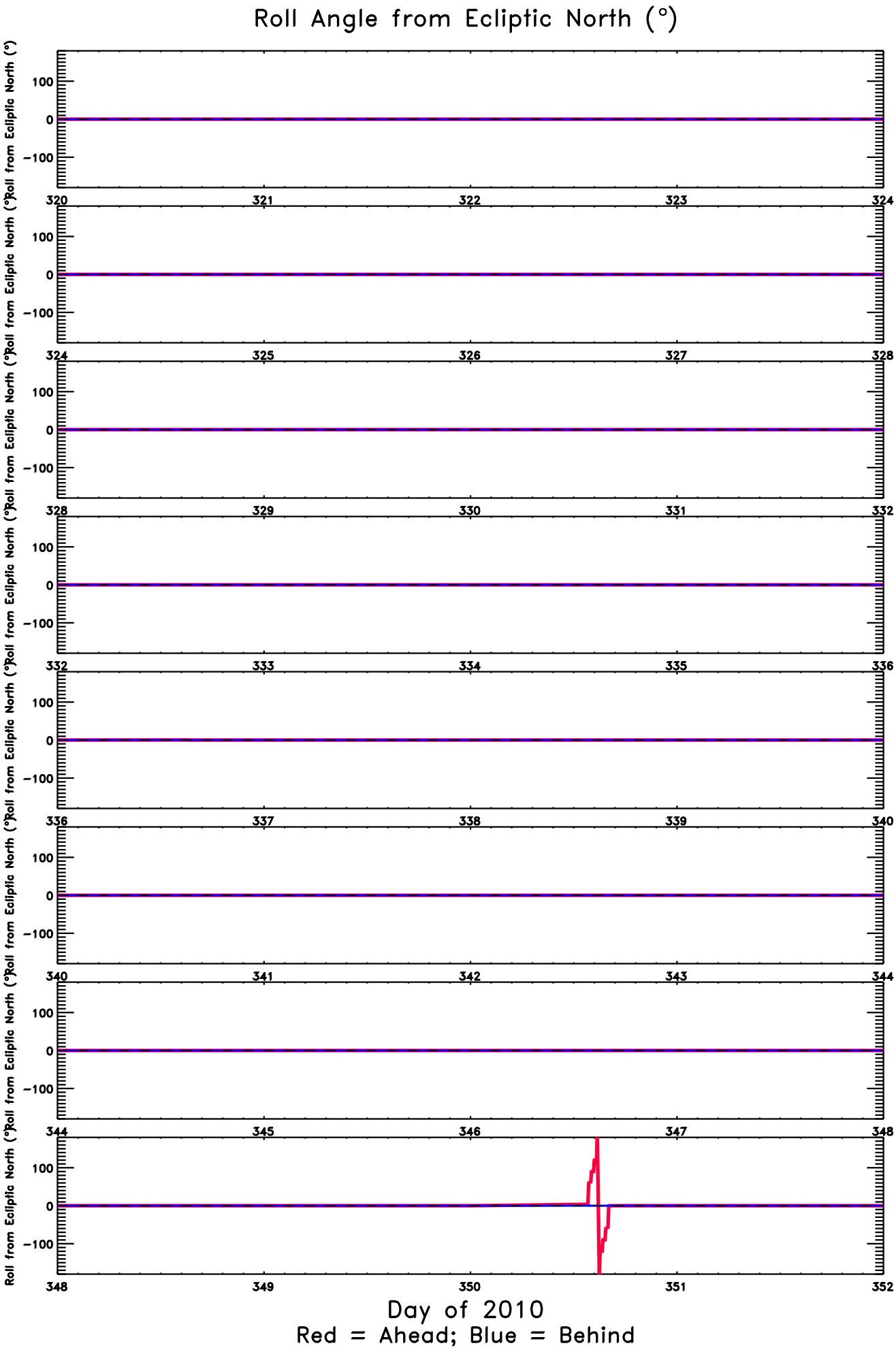
Day of 2010
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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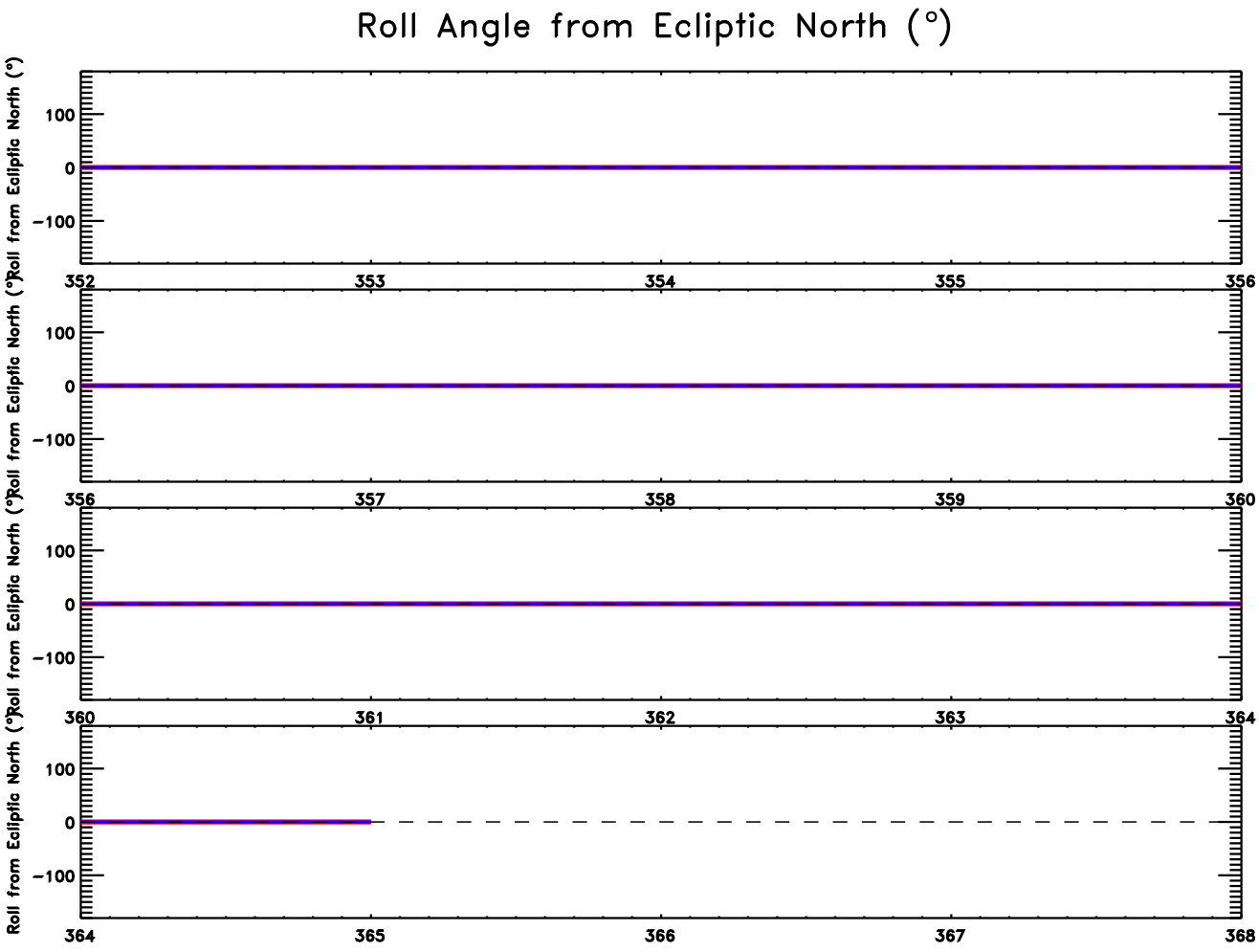
Day of 2010
Red = Ahead; Blue = Behind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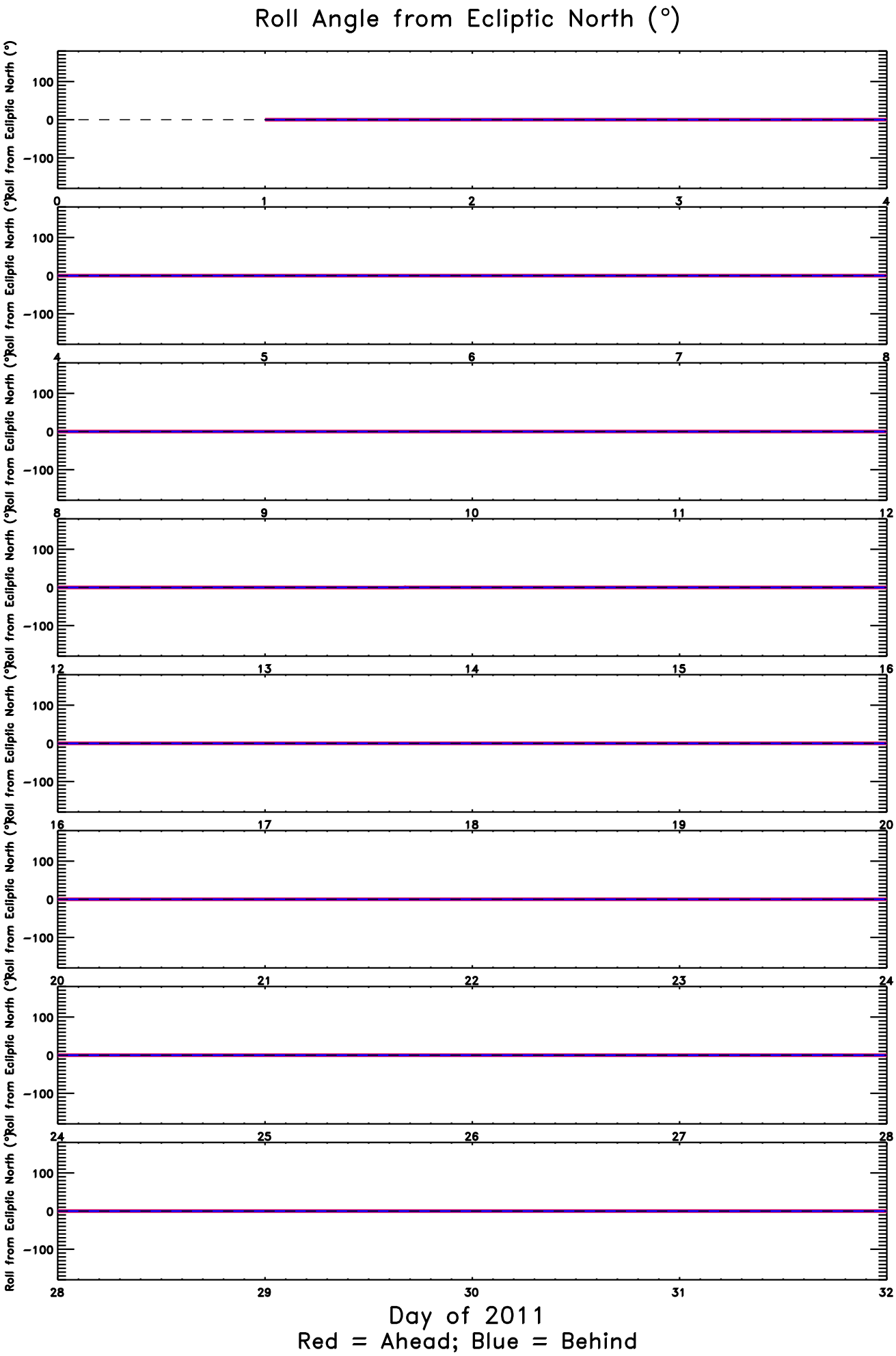
Day of 2010
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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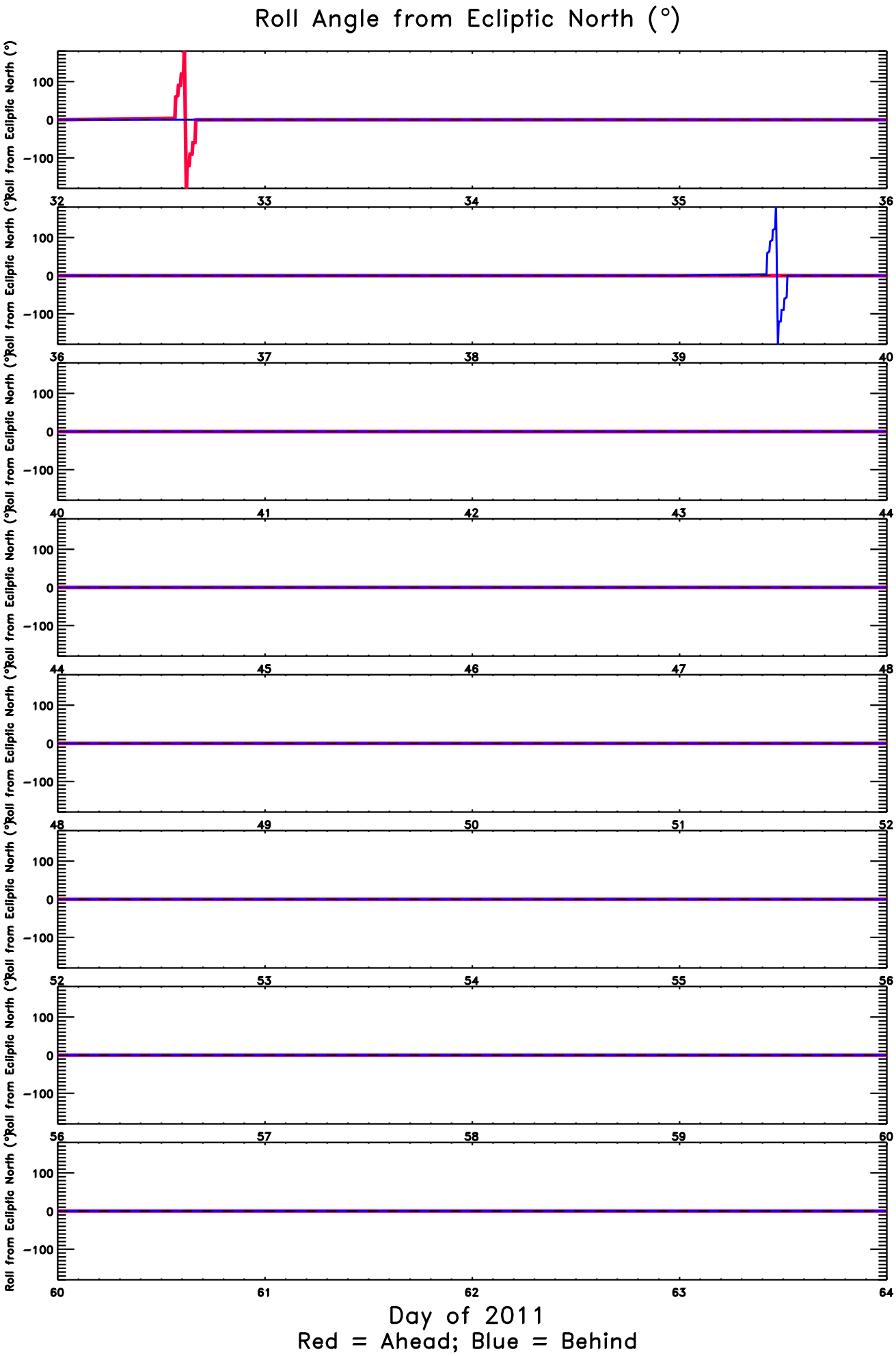
Day of 2011
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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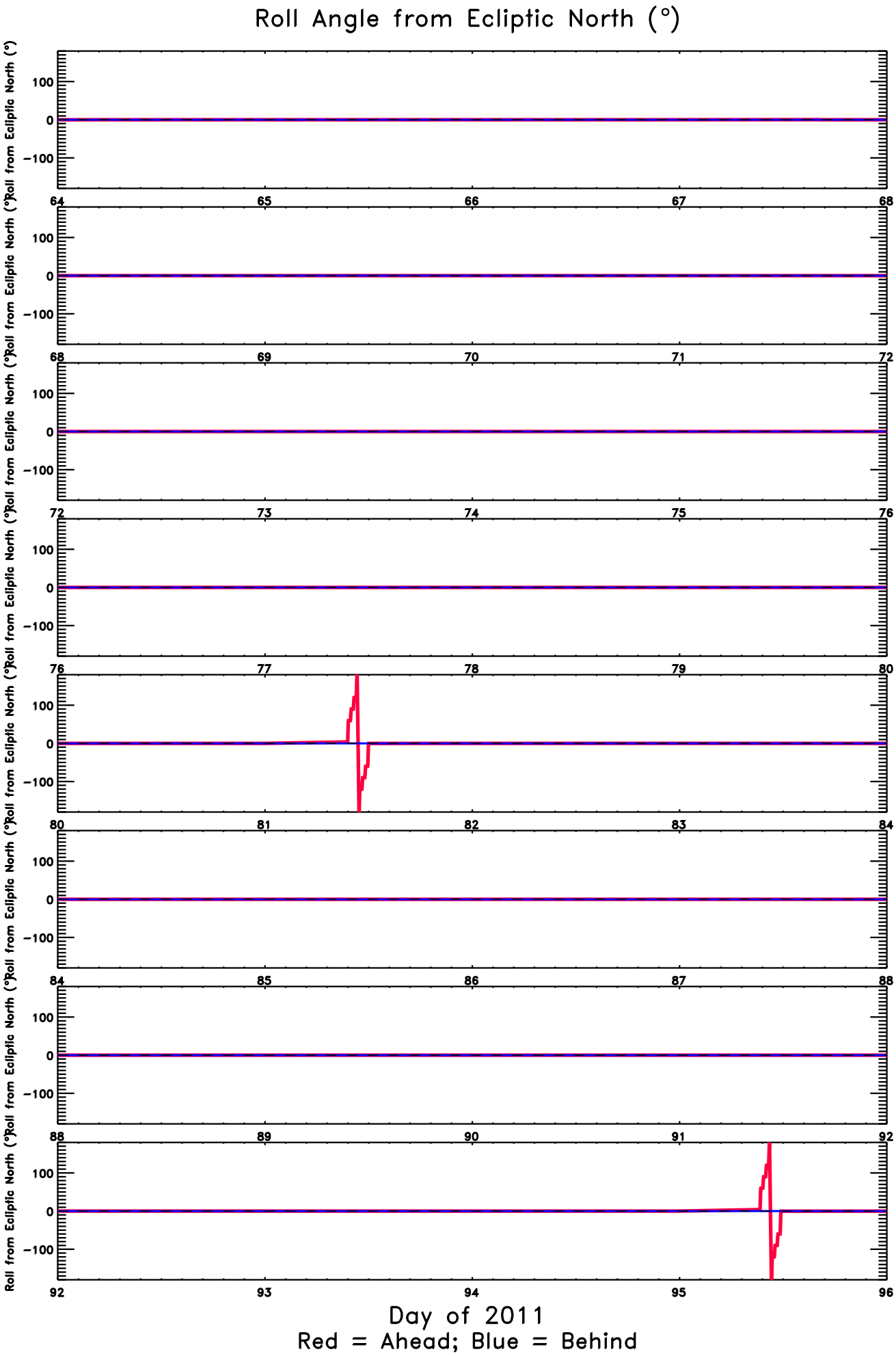
Day of 2011
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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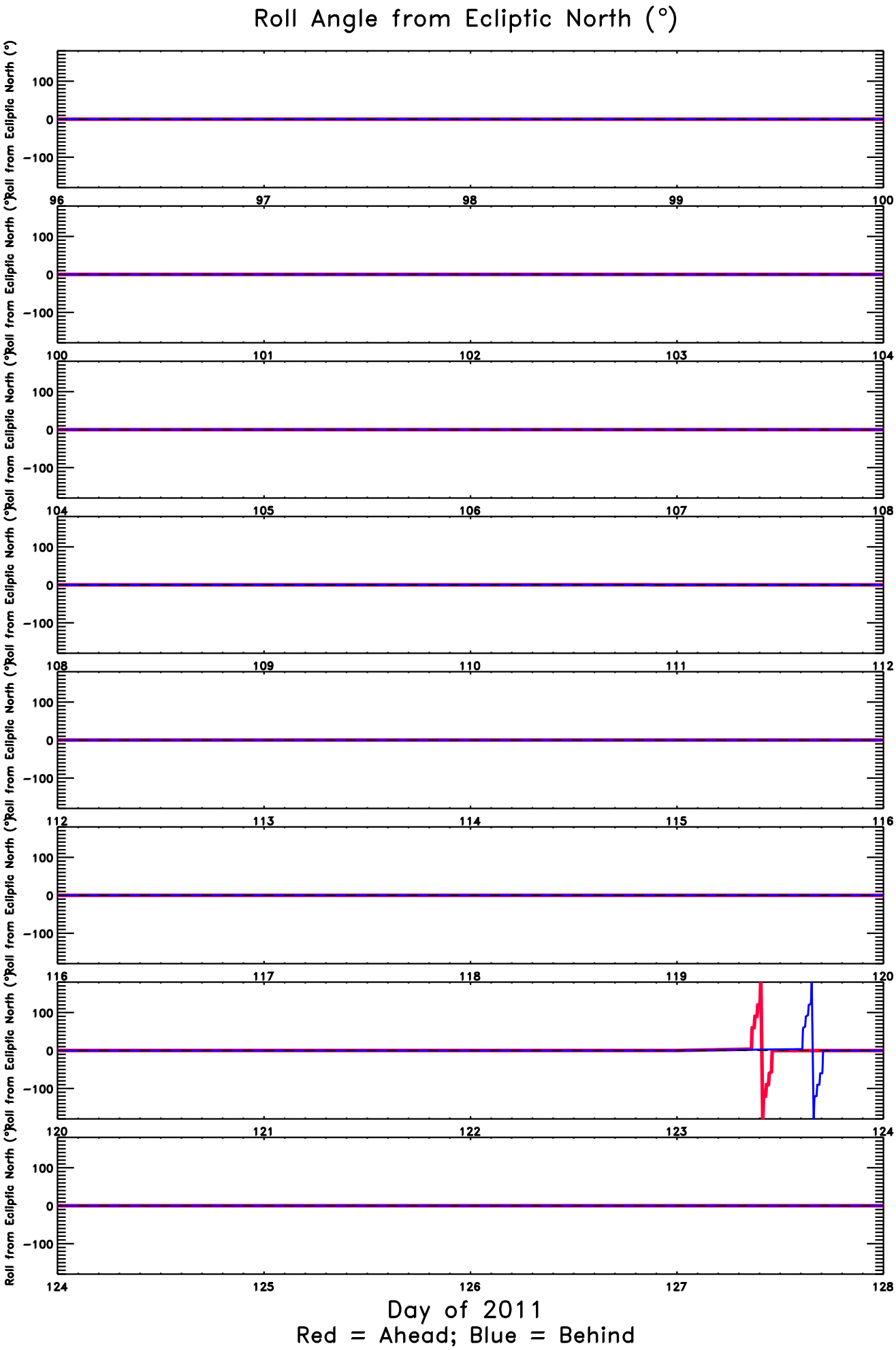
Day of 2011
Red = Ahead; Blue = Behind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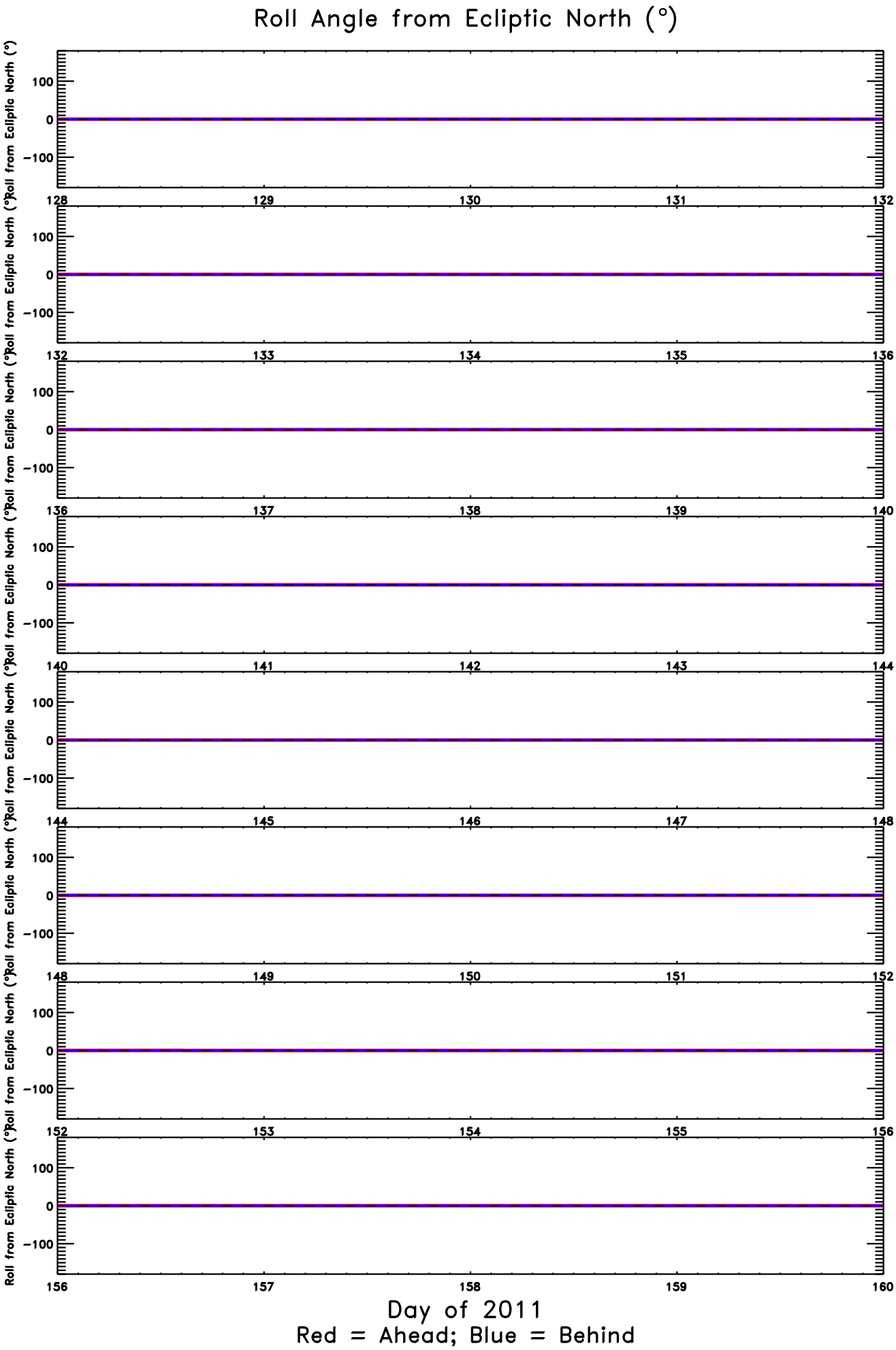
Day of 2011
Red = Ahead; Blue = Behind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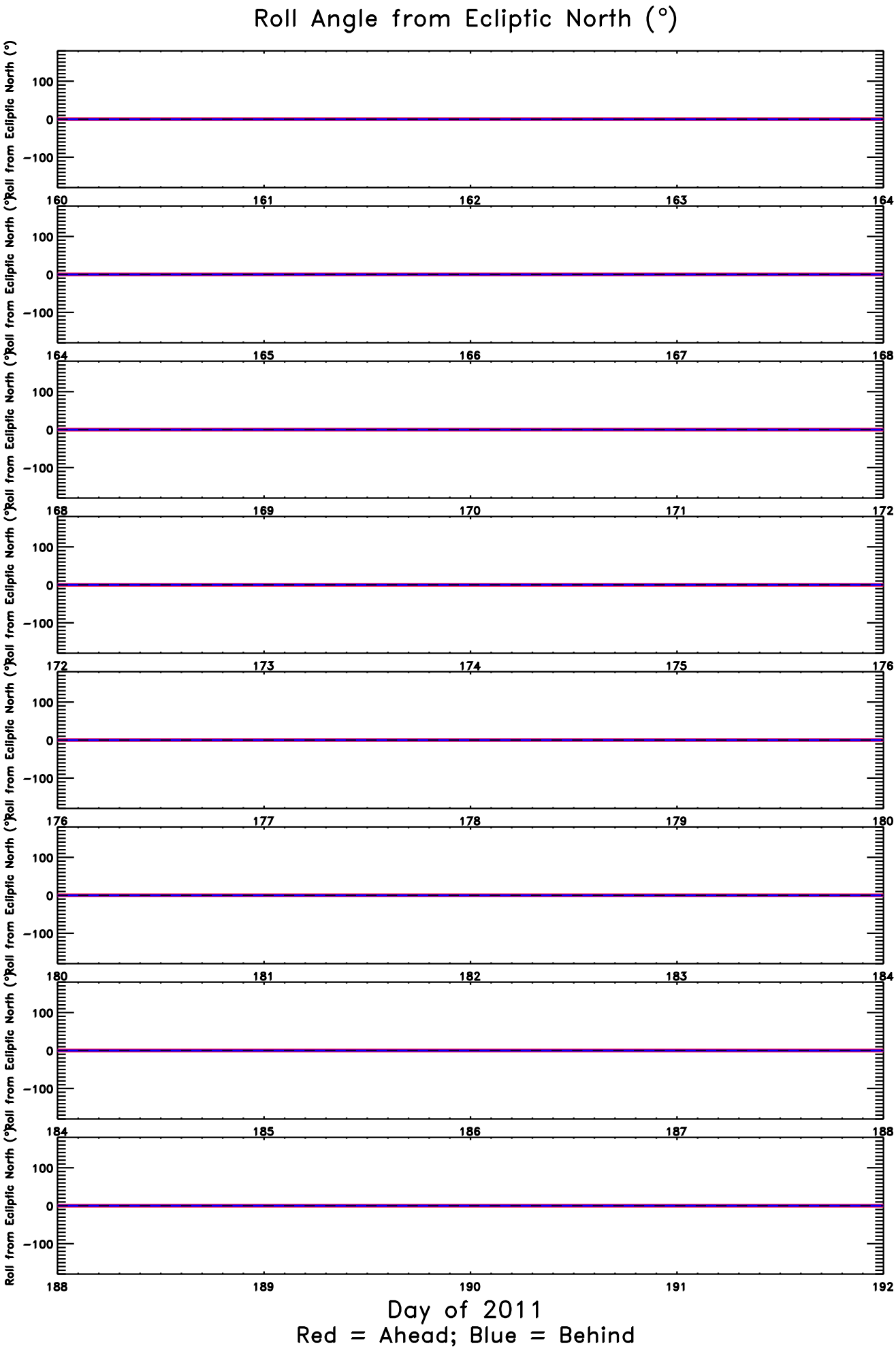
Day of 2011
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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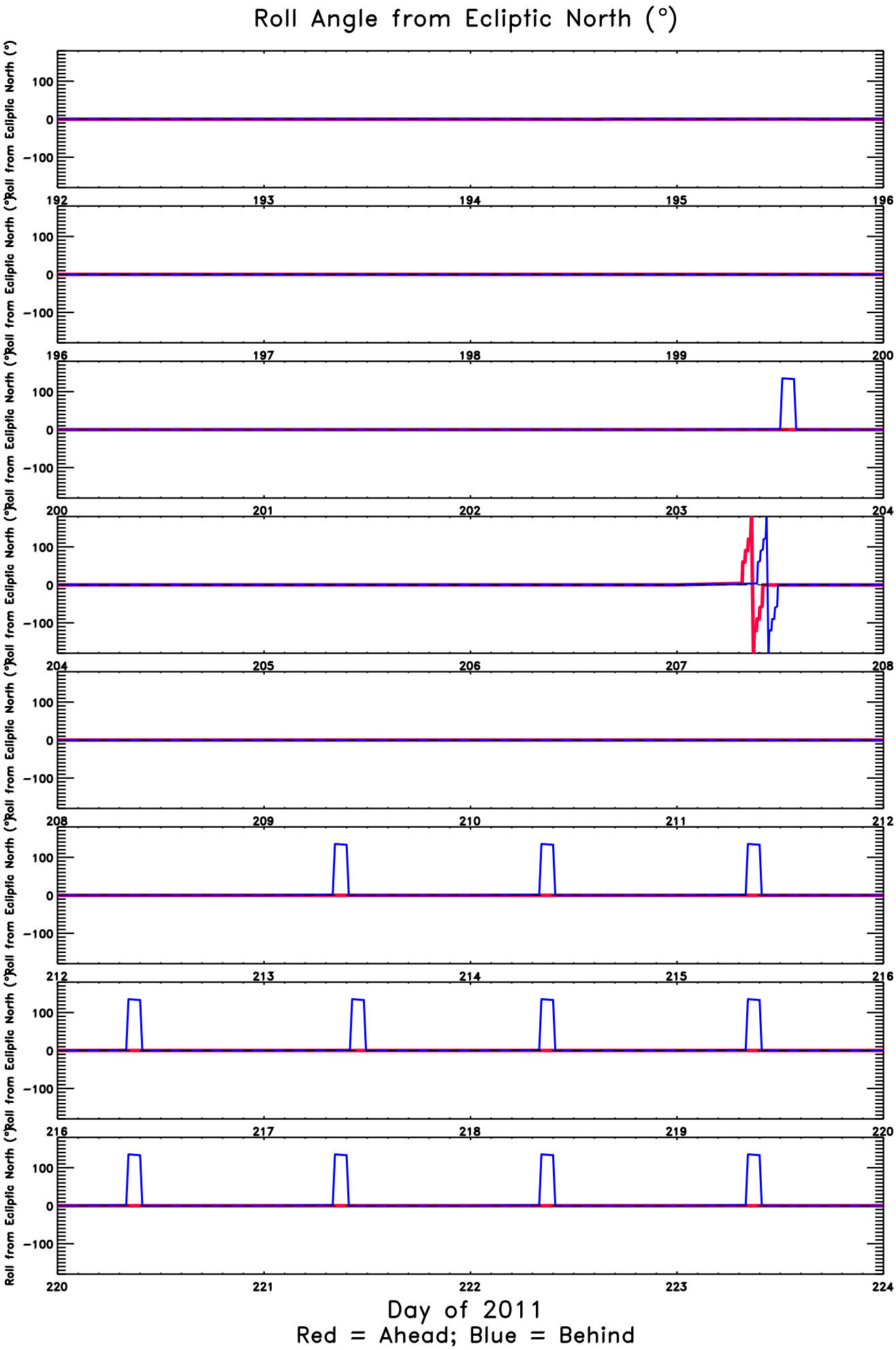
Day of 2011
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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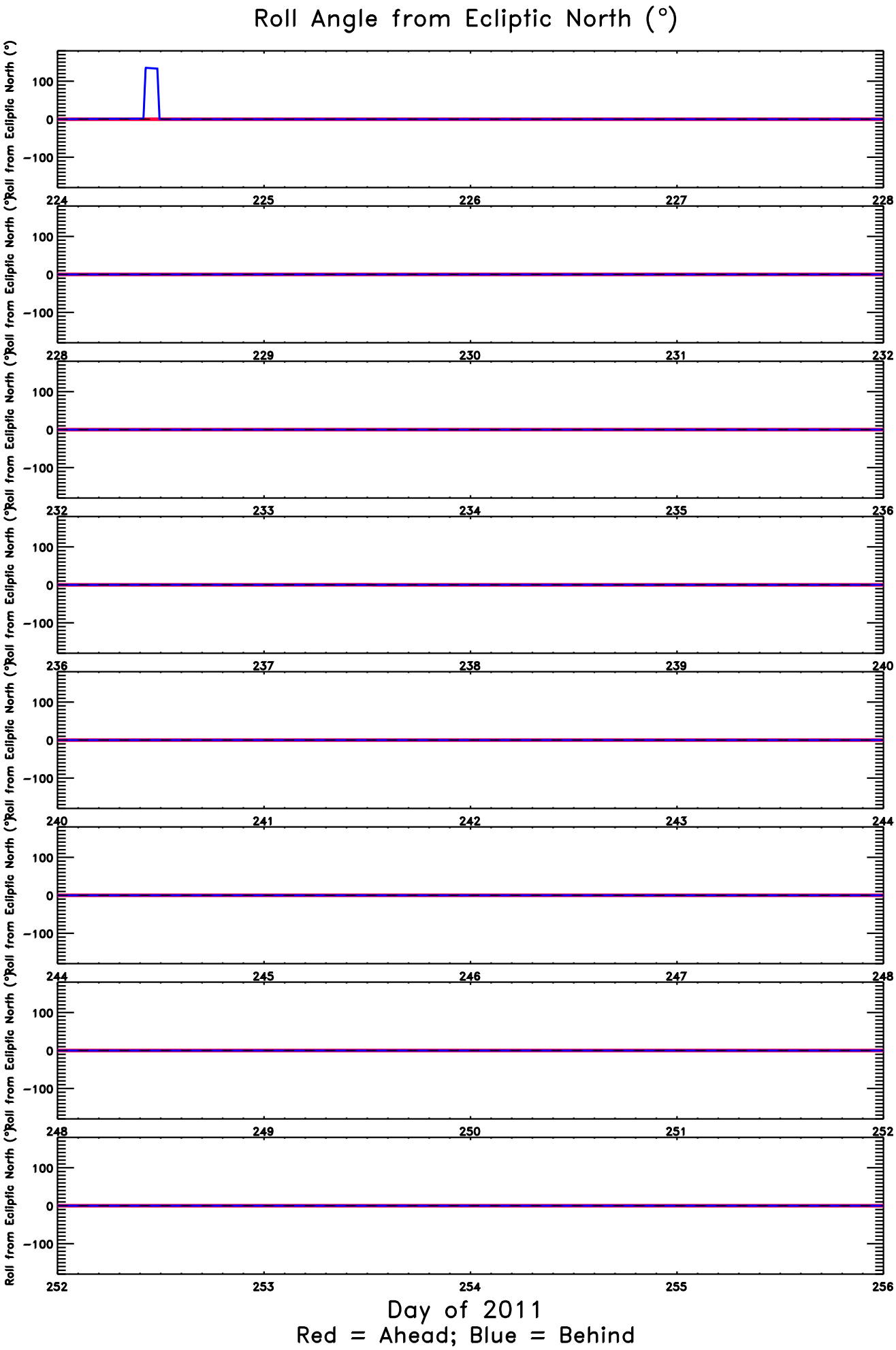
Day of 2011
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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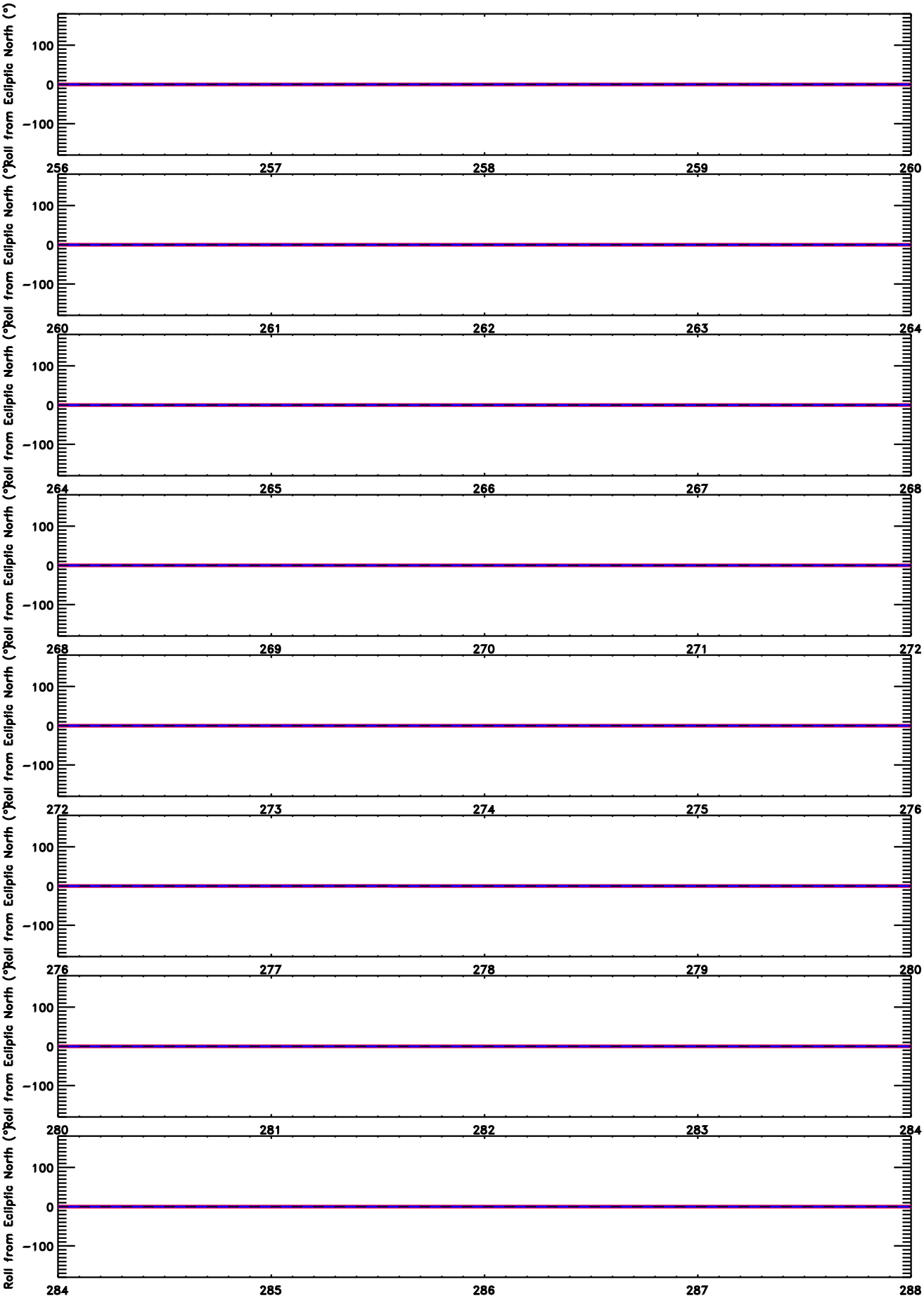
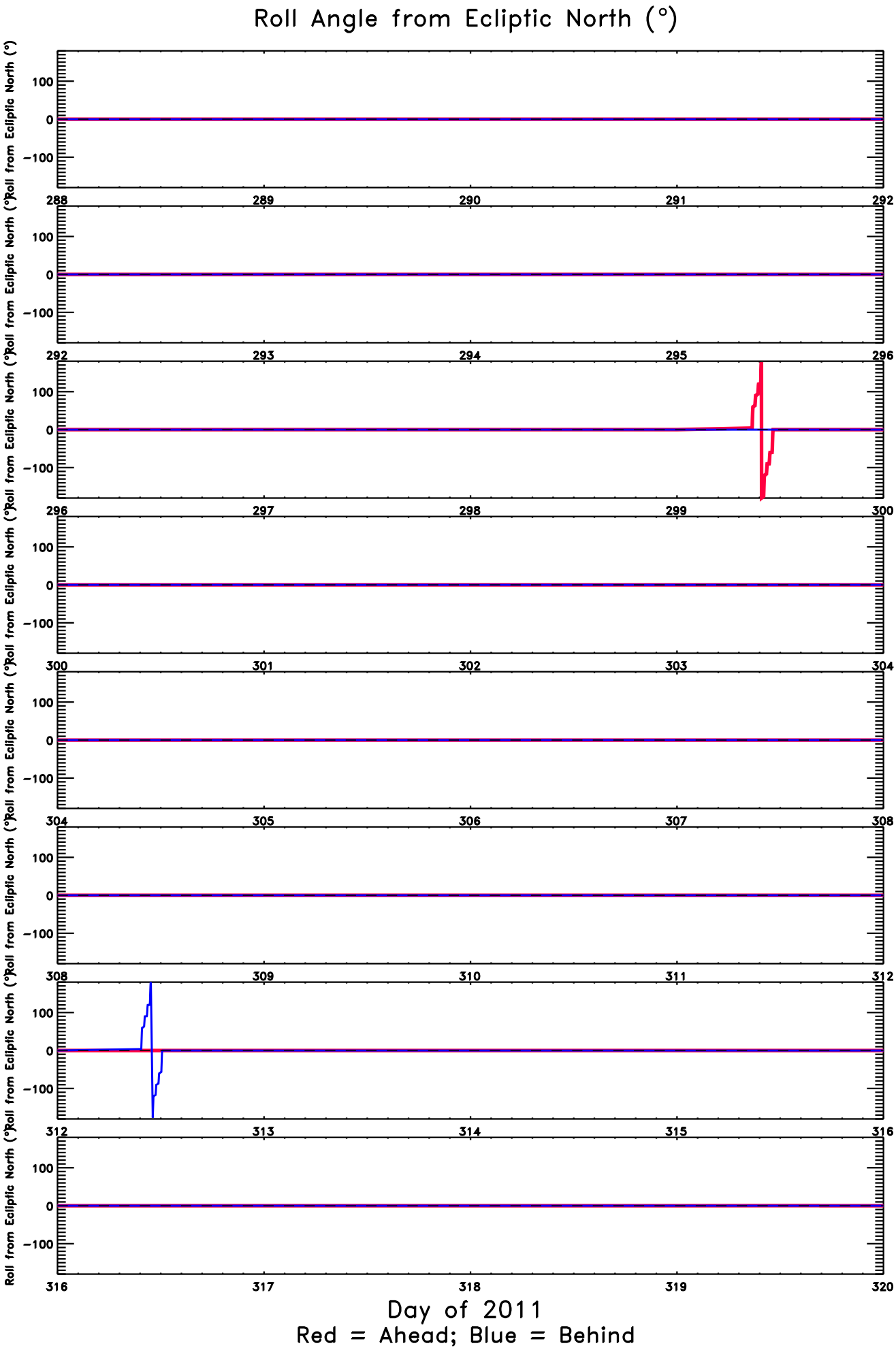
Day of 2011
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2011

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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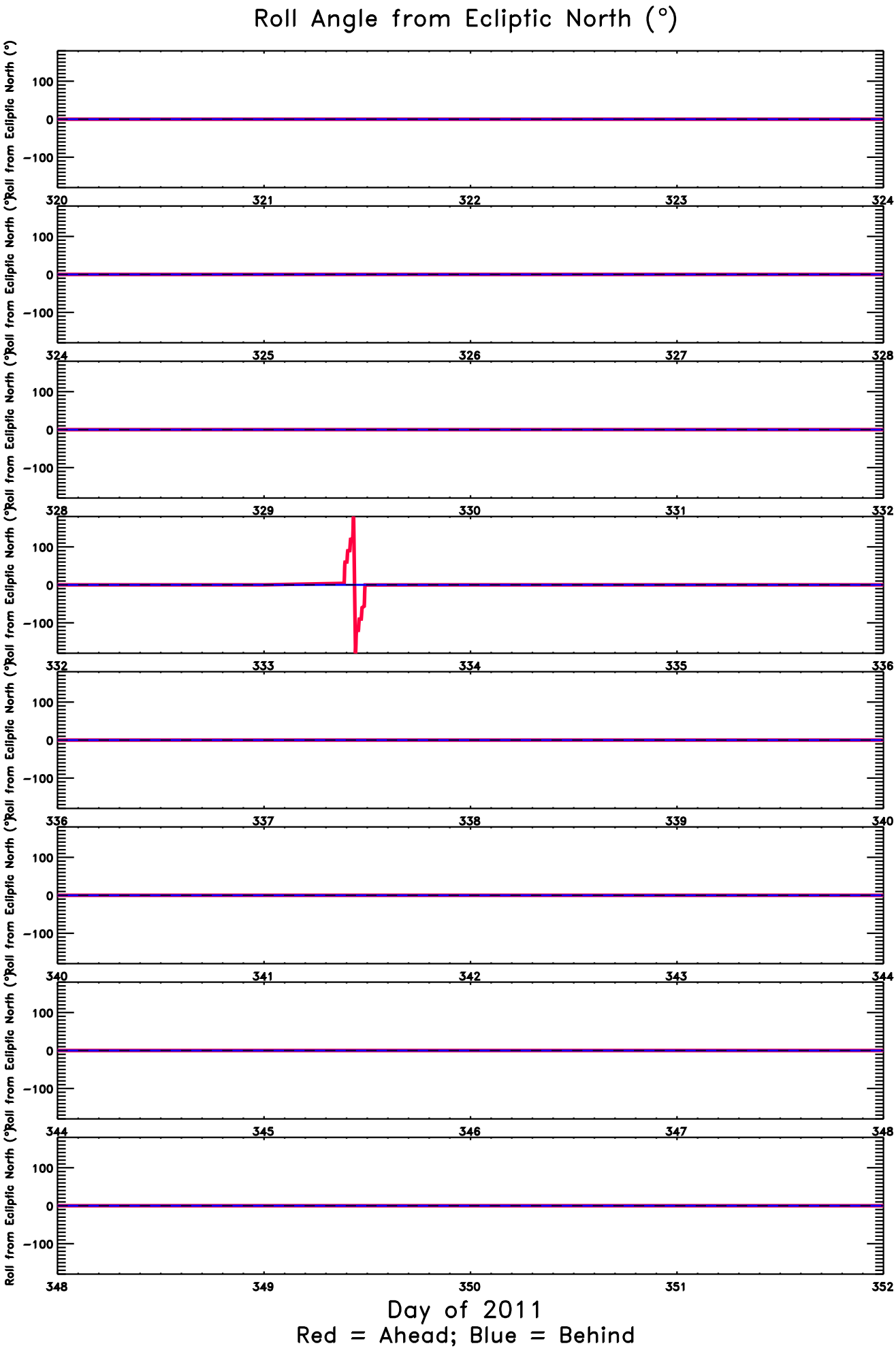
Day of 2011
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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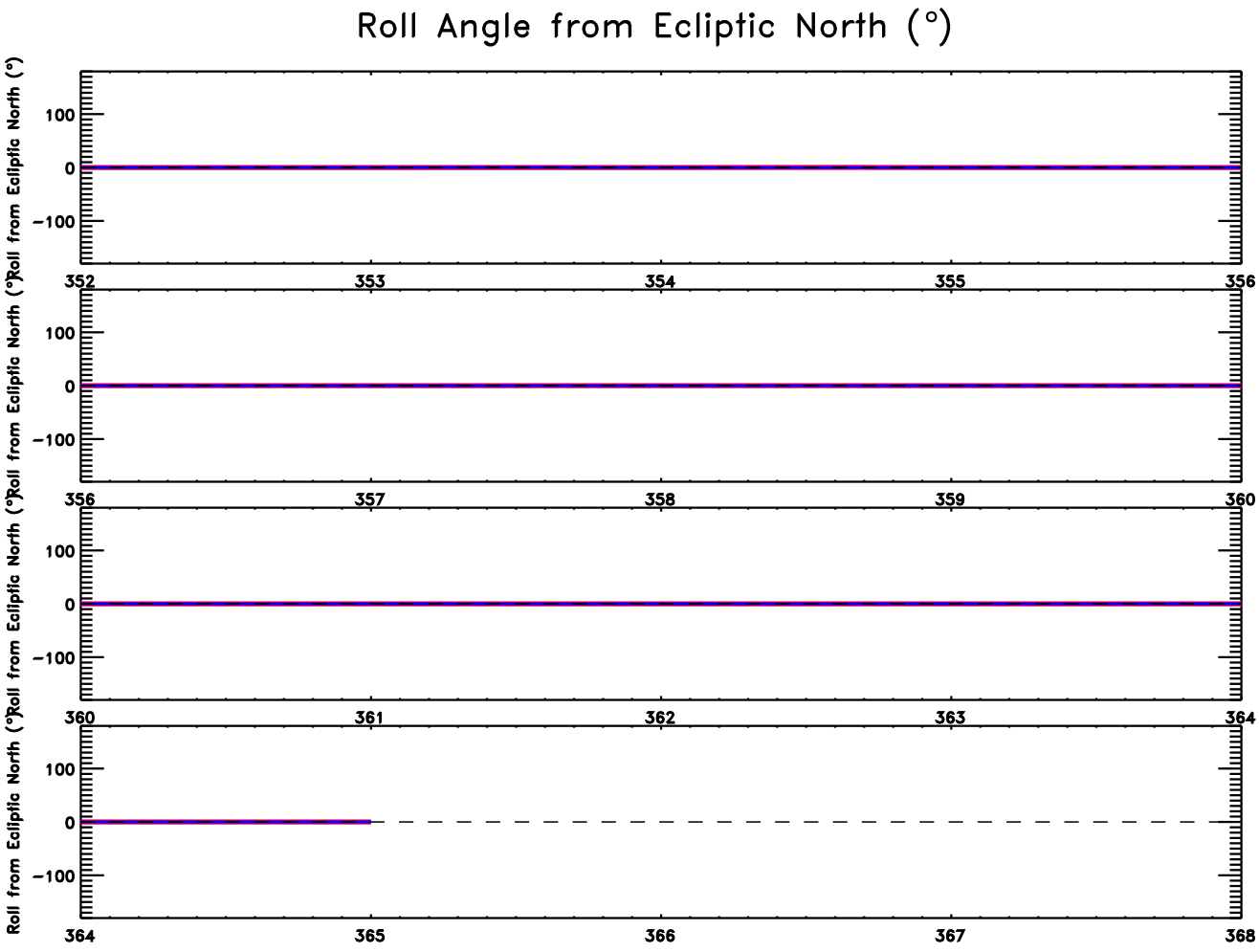
352
Day of 2011
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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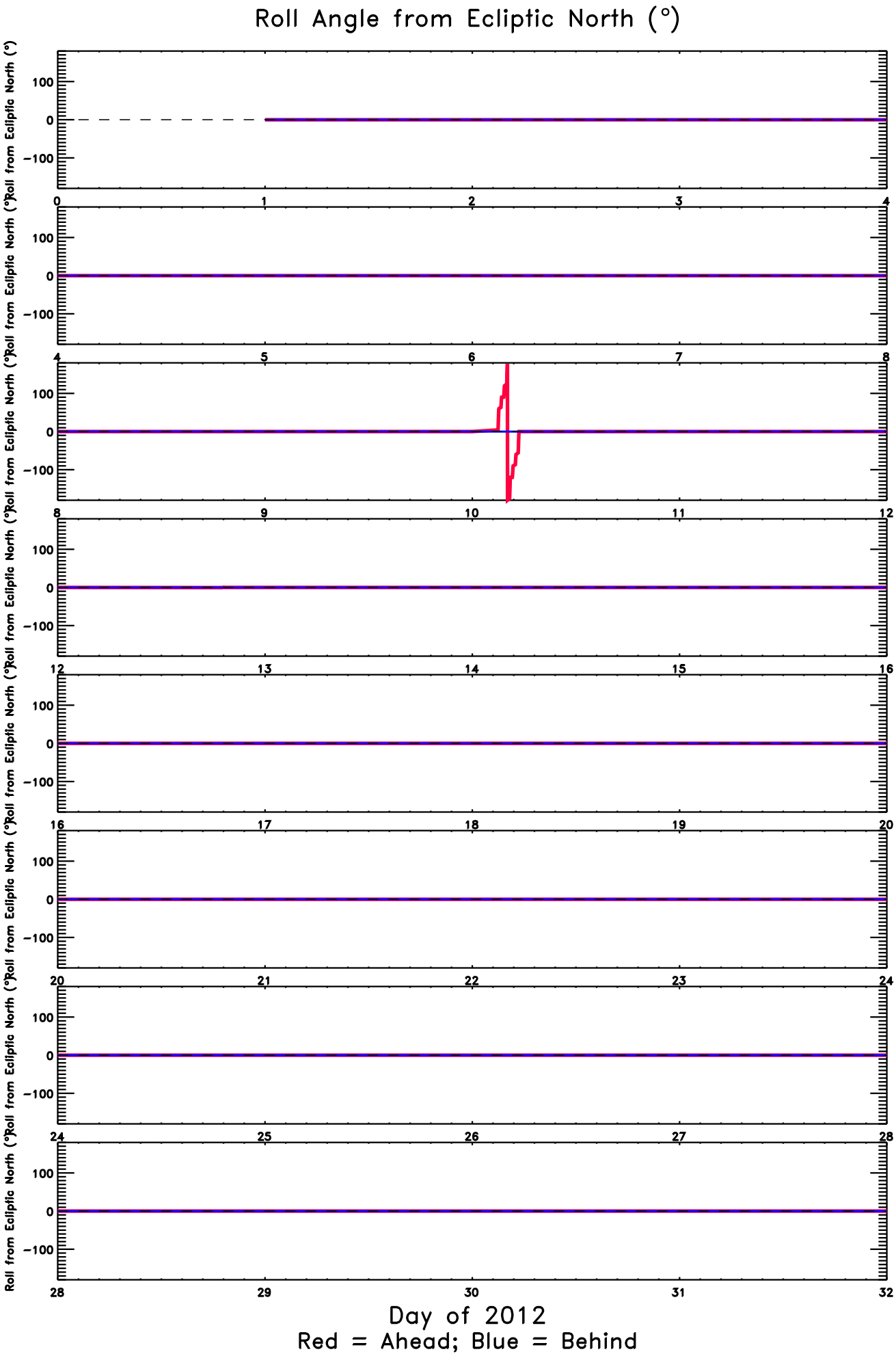
Day of 2011
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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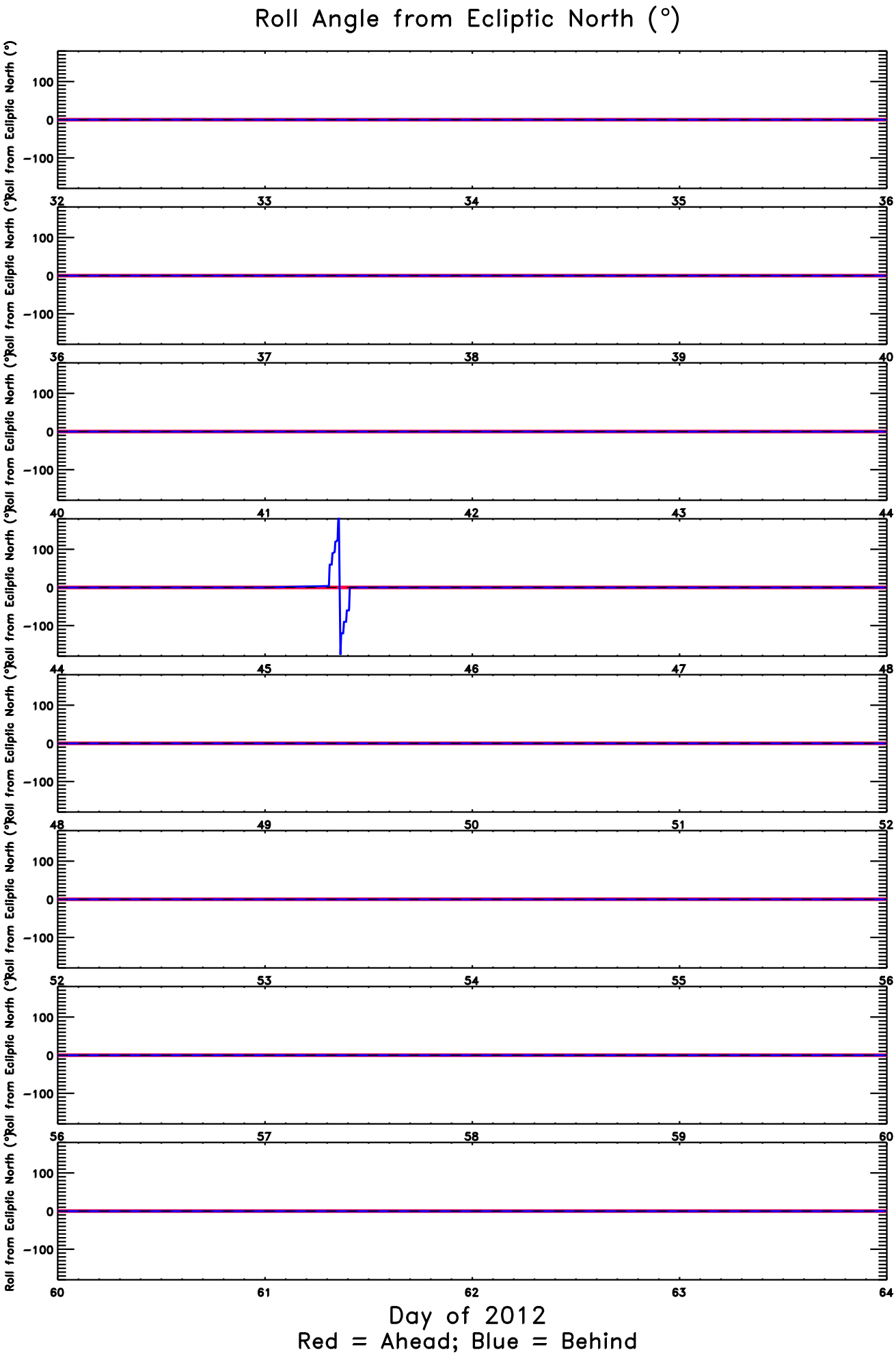
Day of 2012
Red = Ahead; Blue = Behind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Roll from Ecliptic North (°)
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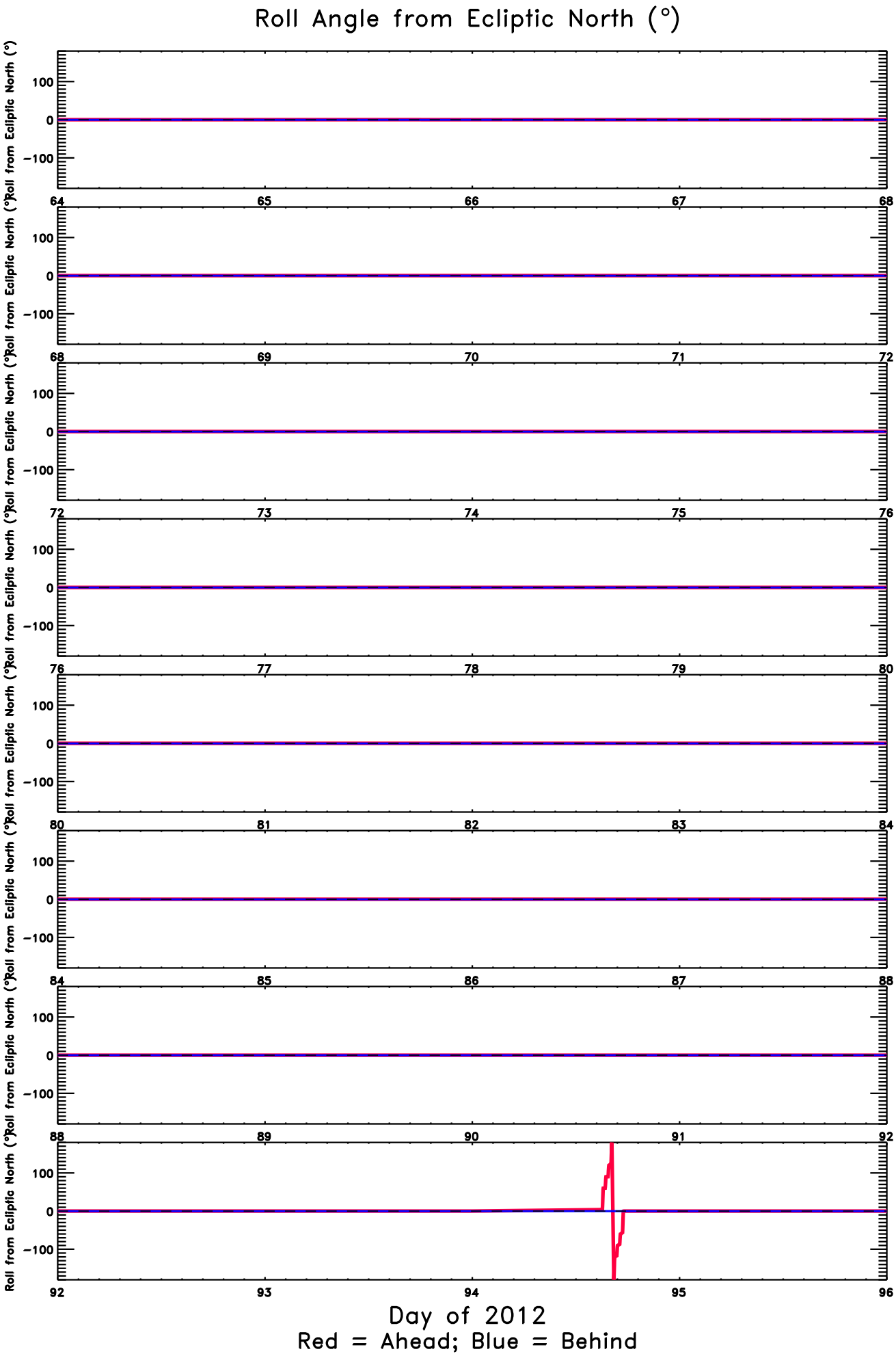
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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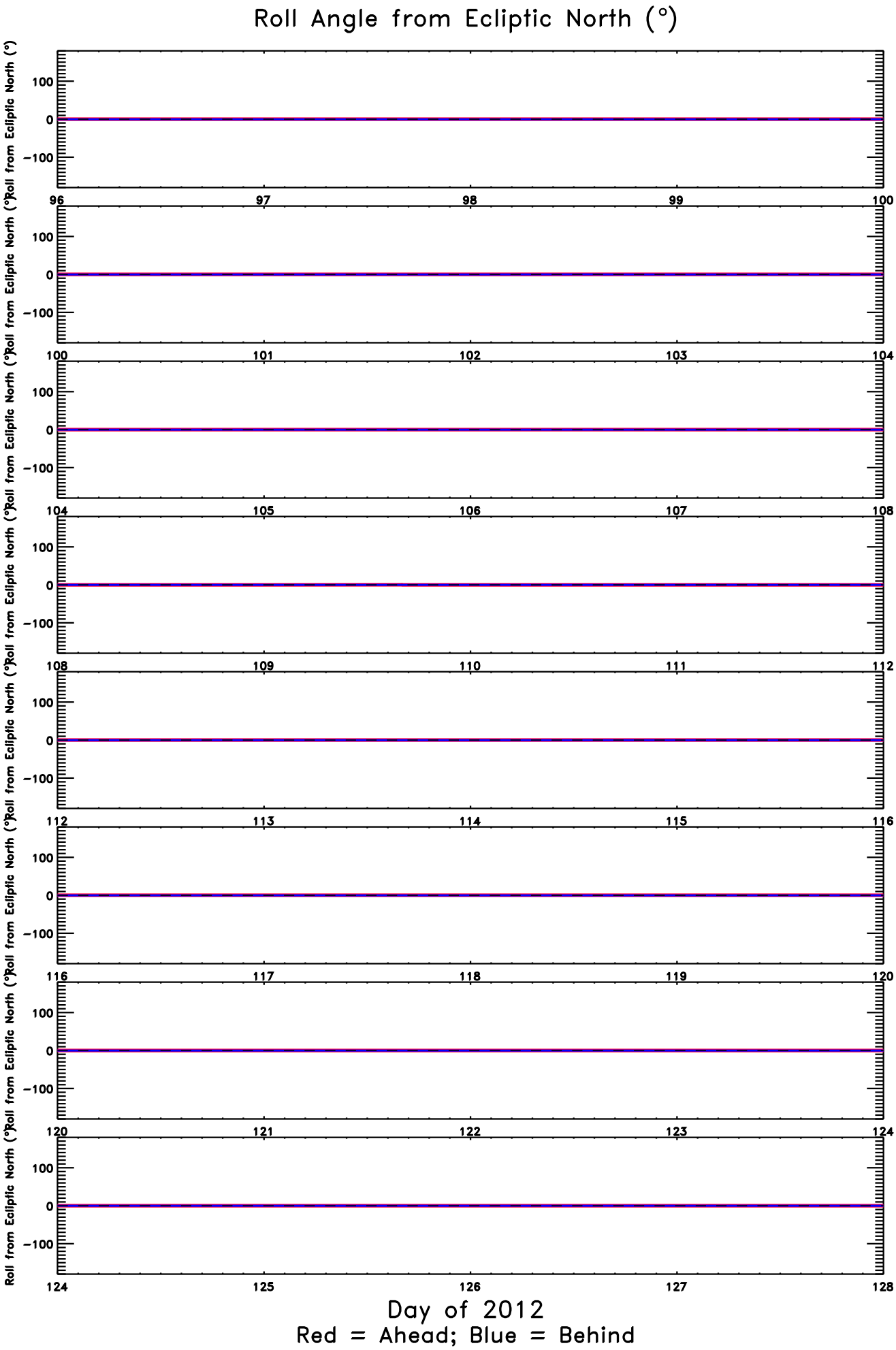
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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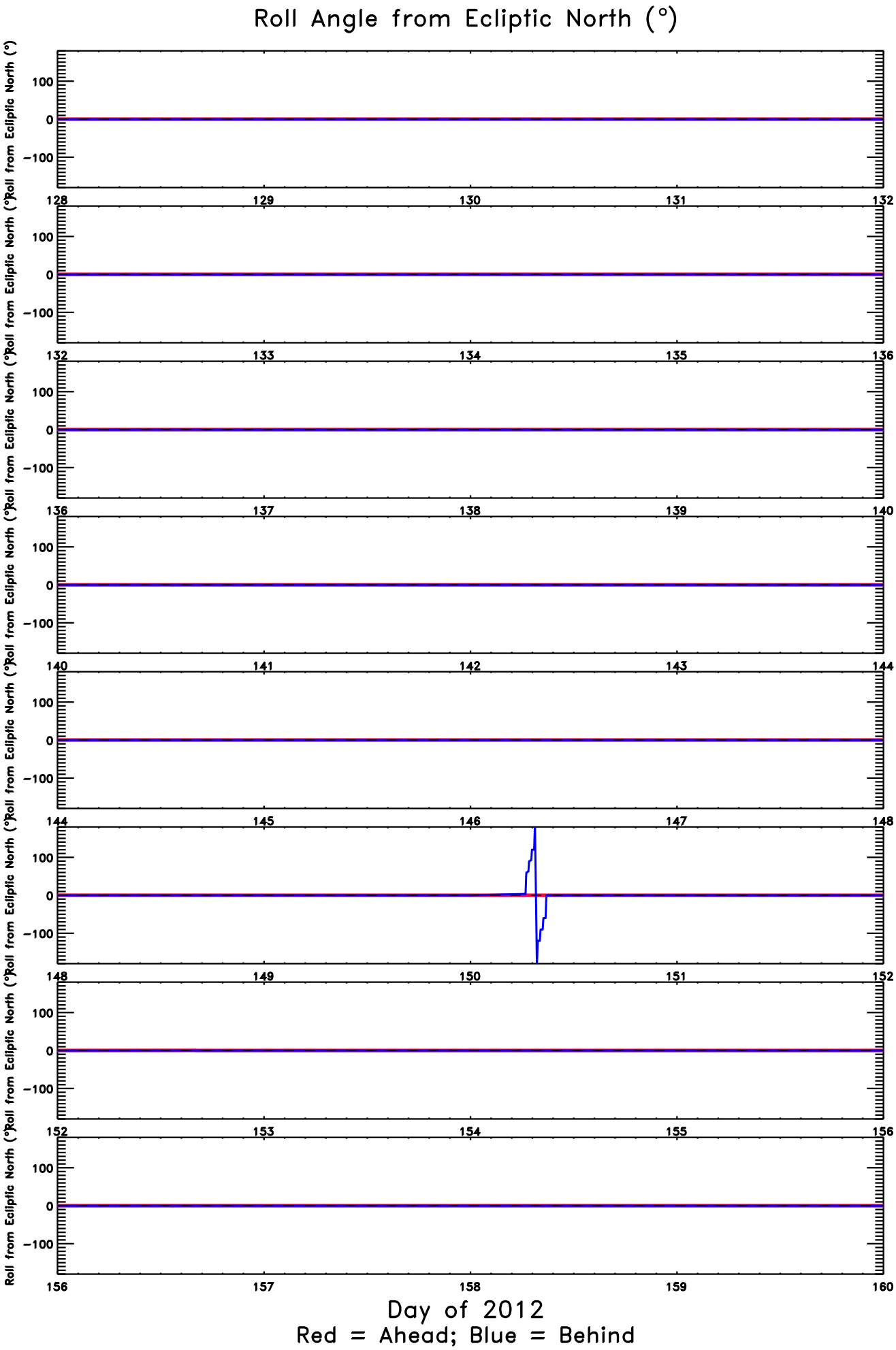
Day of 2012
Red = Ahead; Blue = Behind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Roll from Ecliptic North (°)
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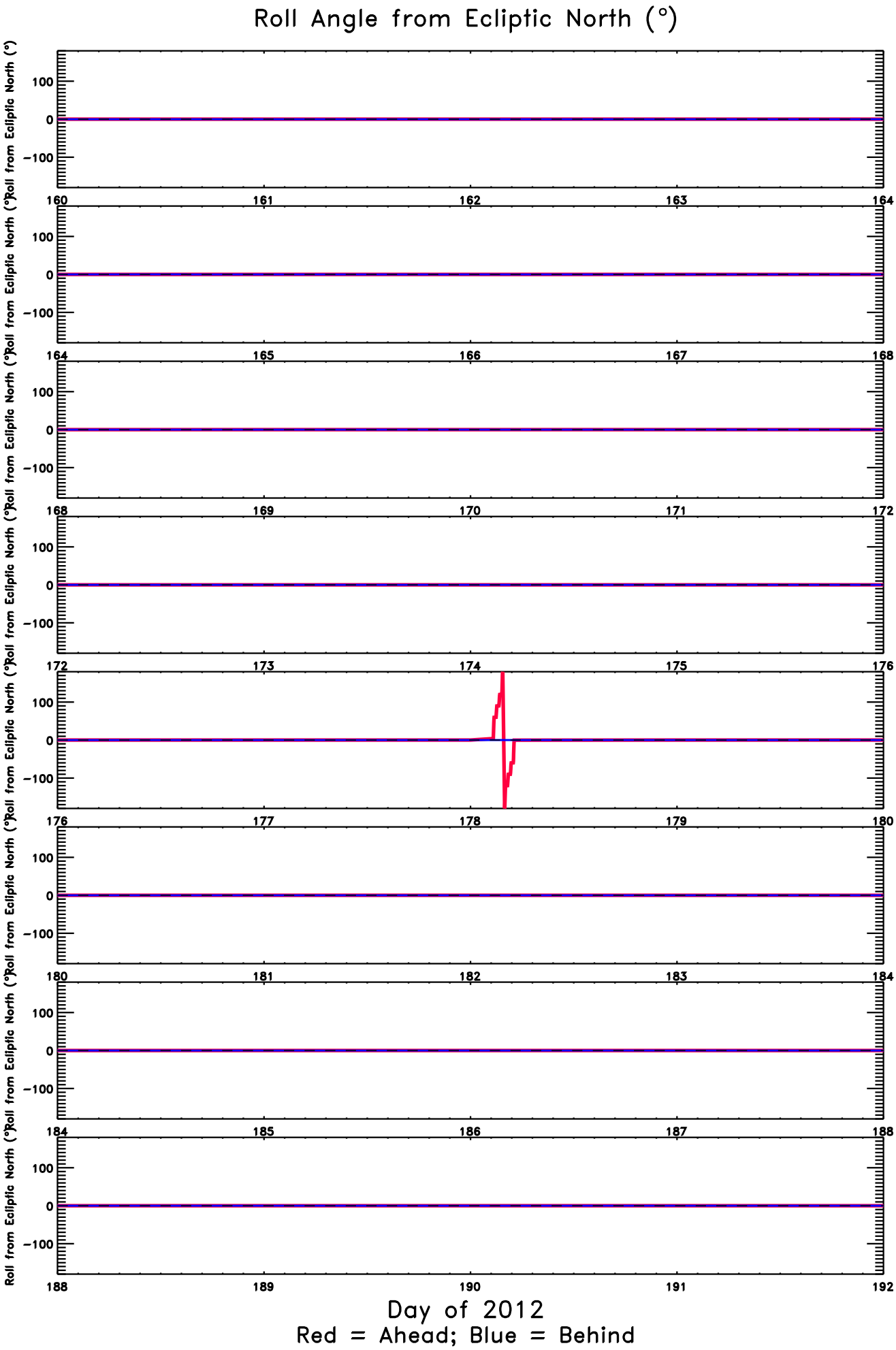
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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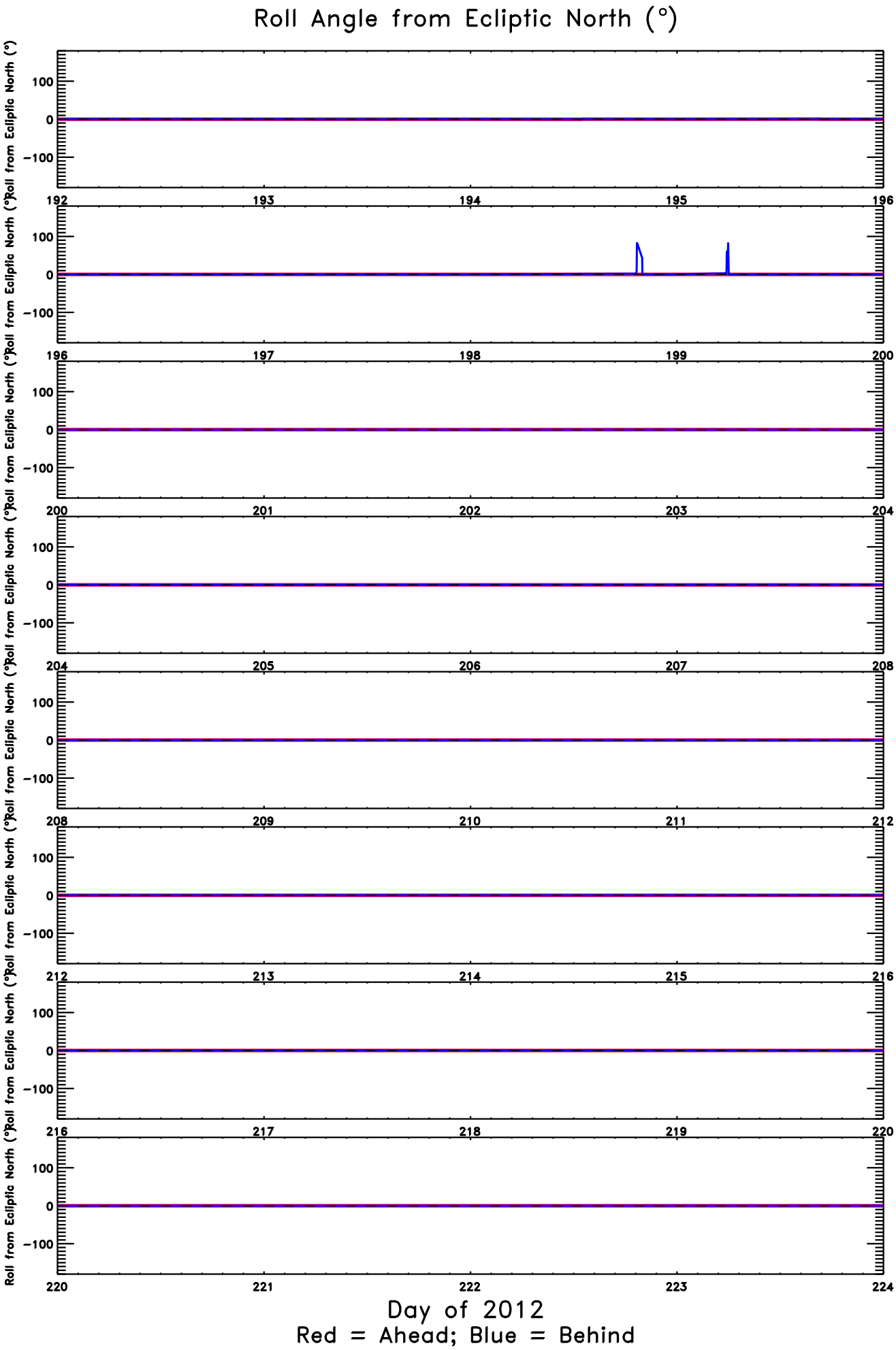
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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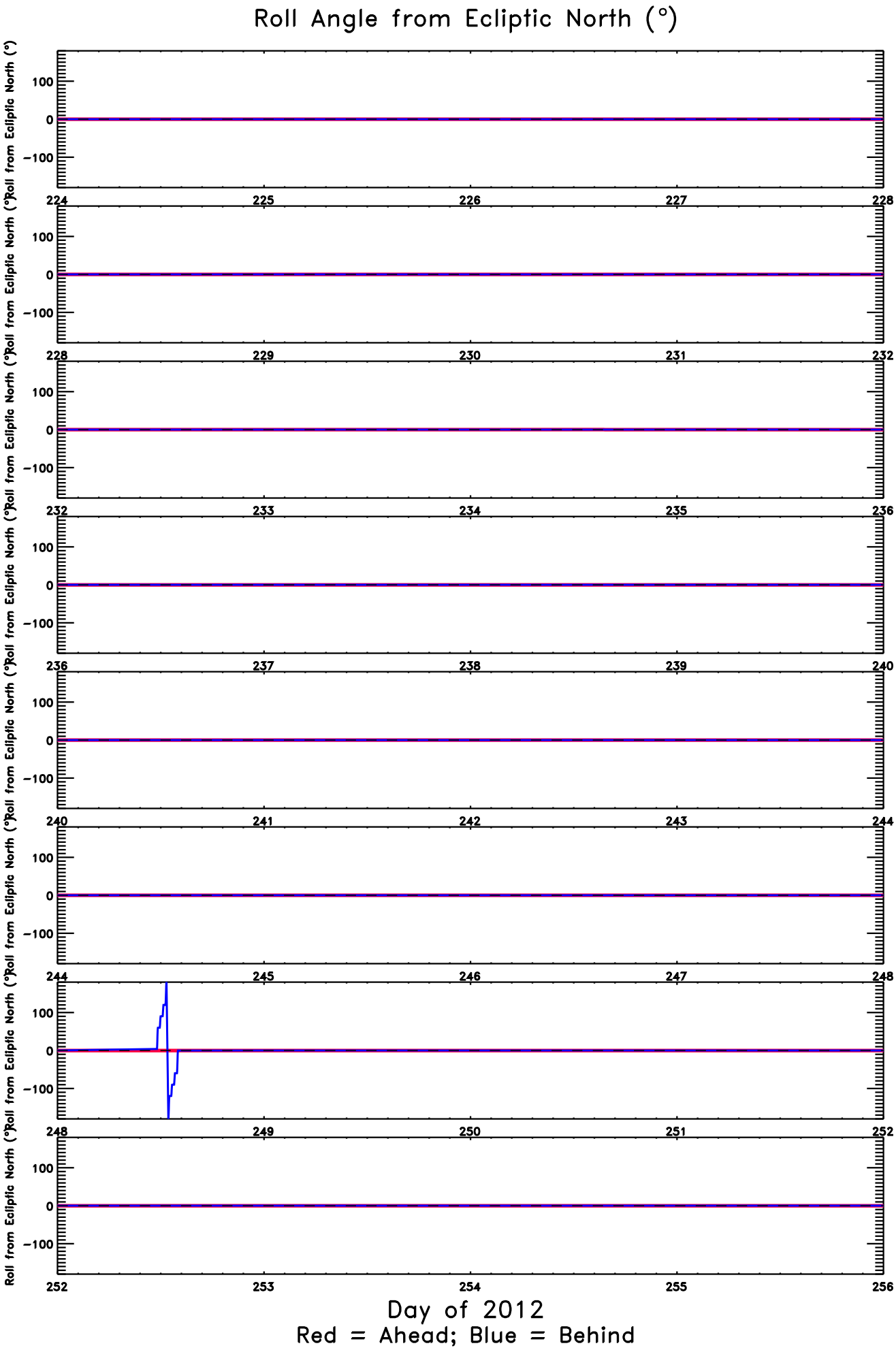
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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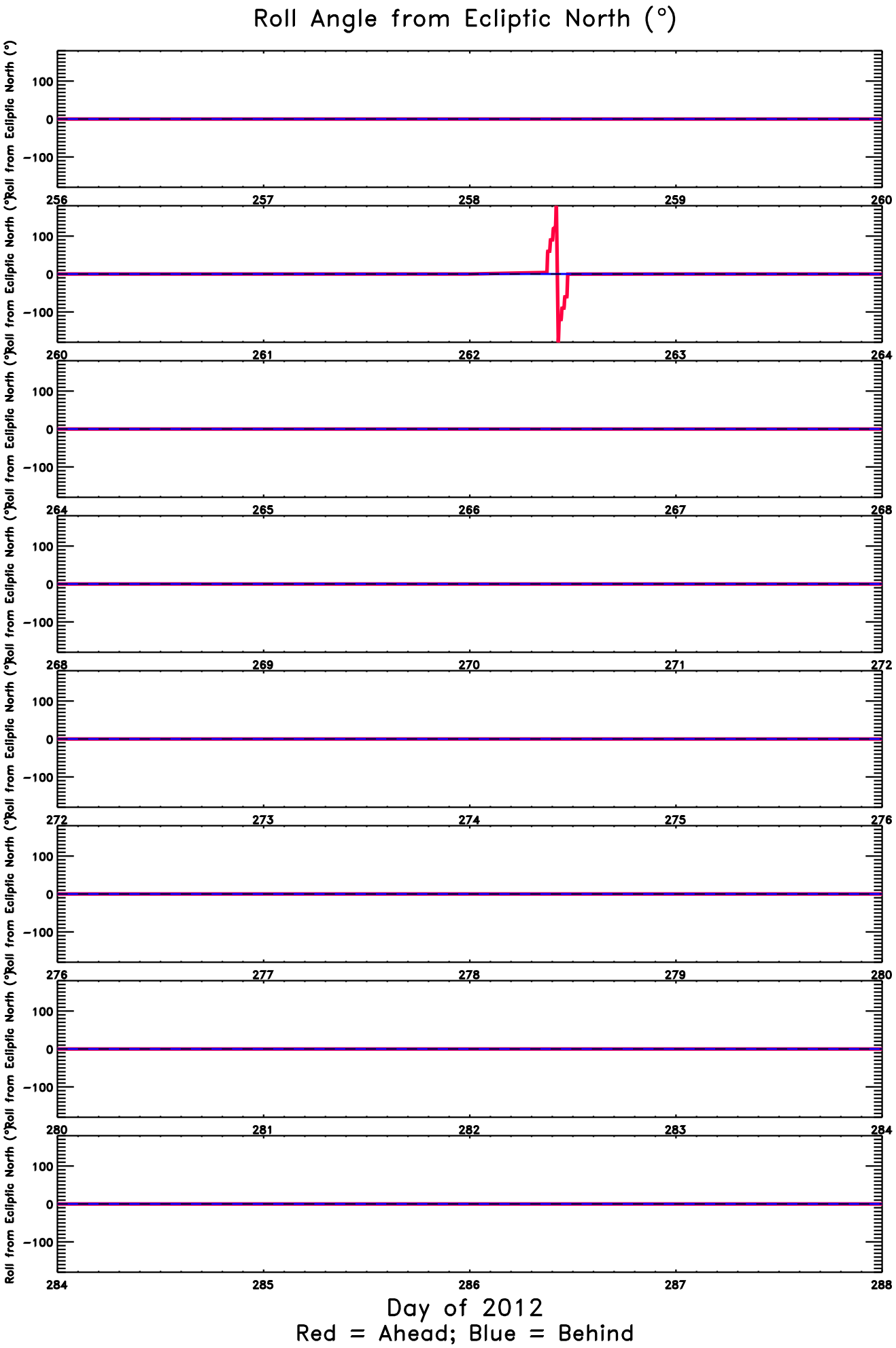
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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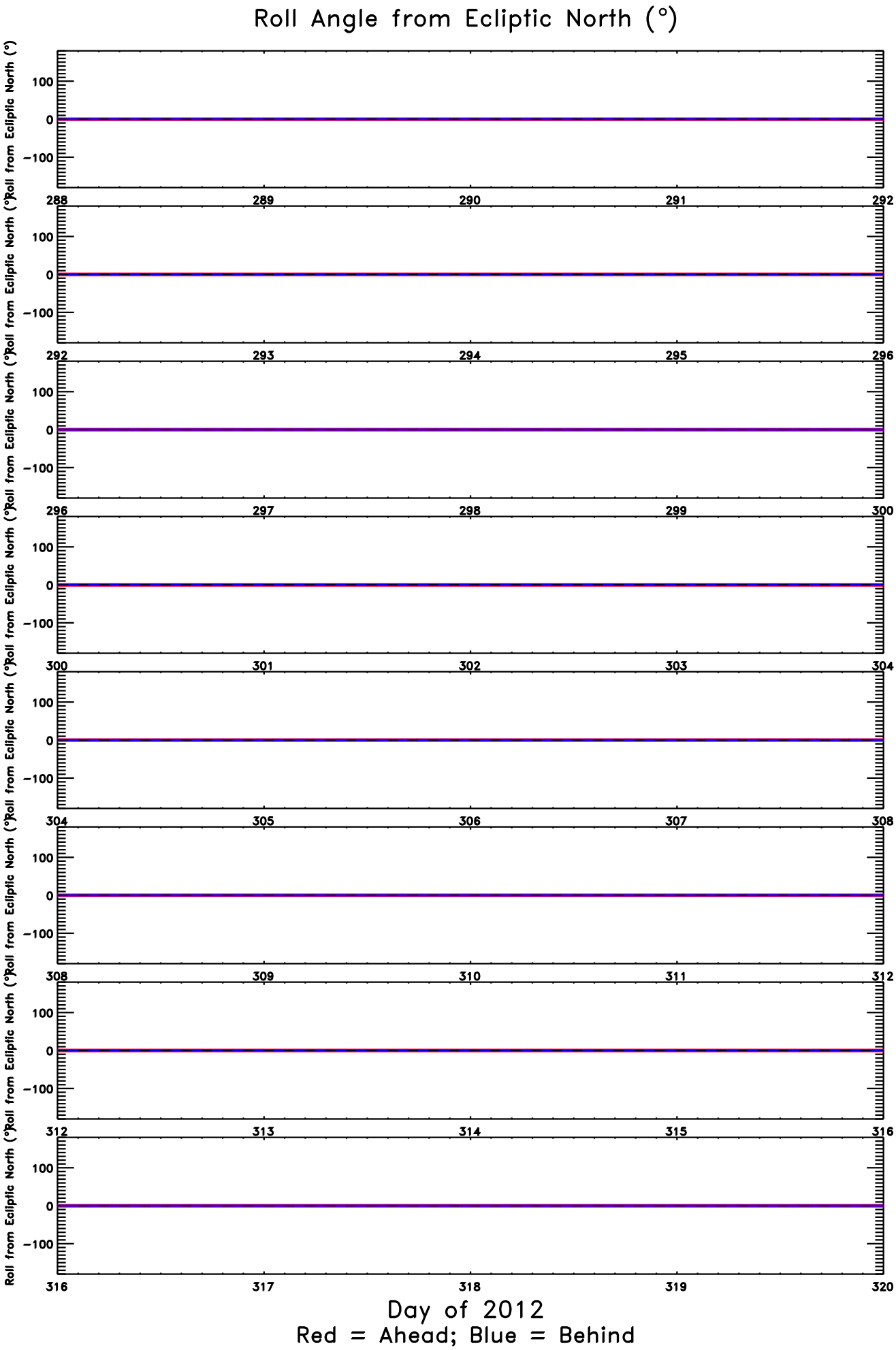
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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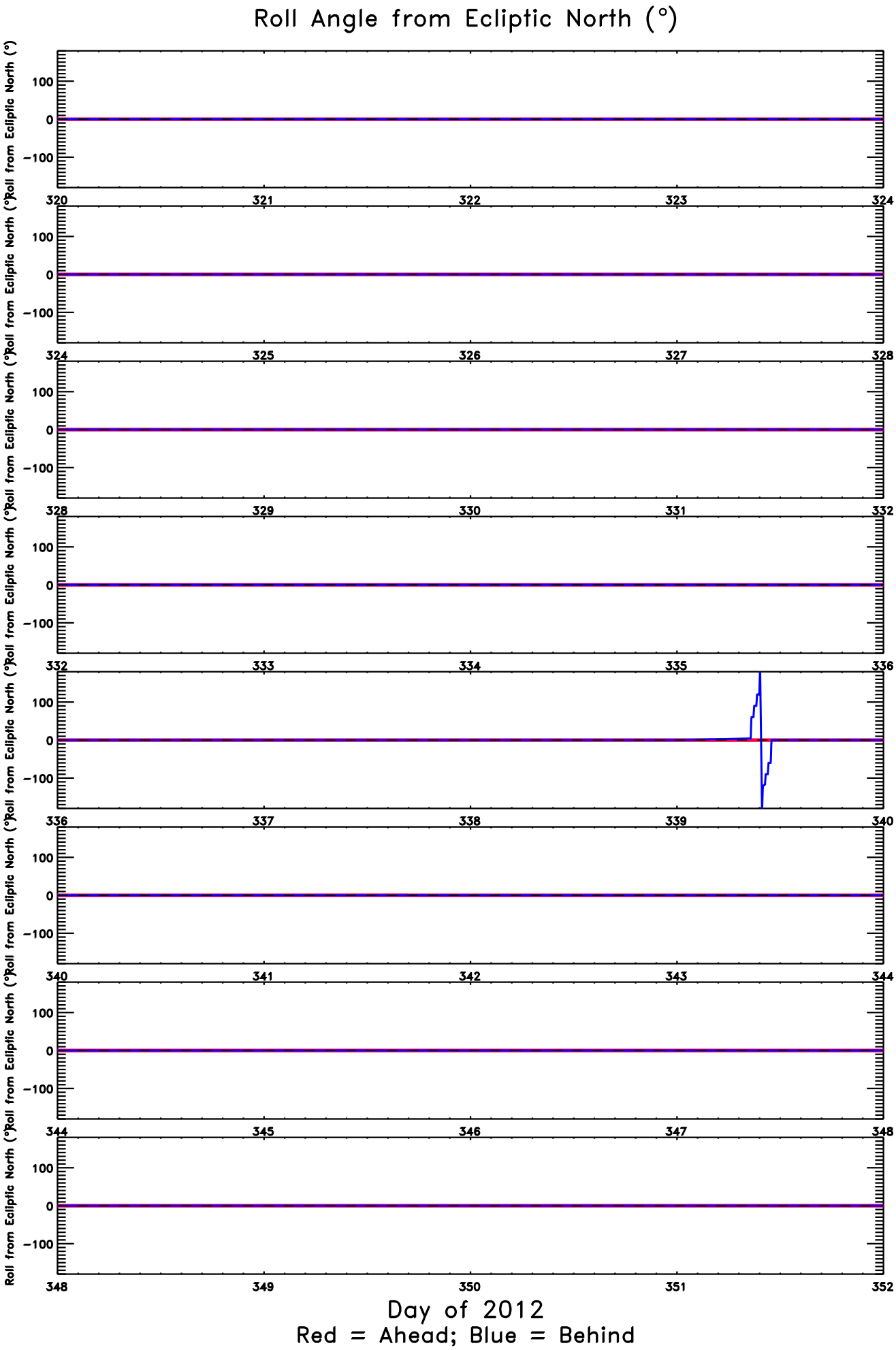
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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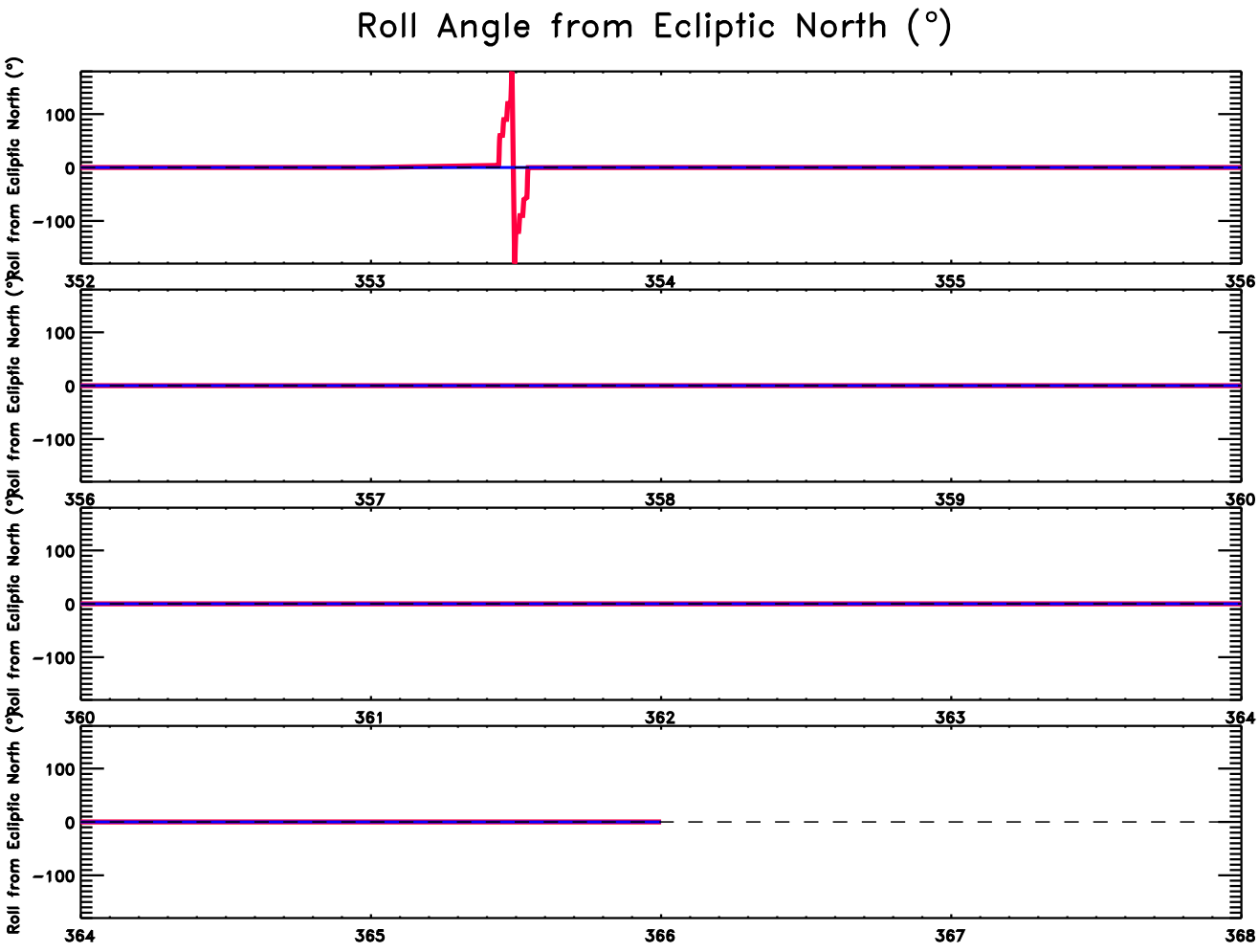
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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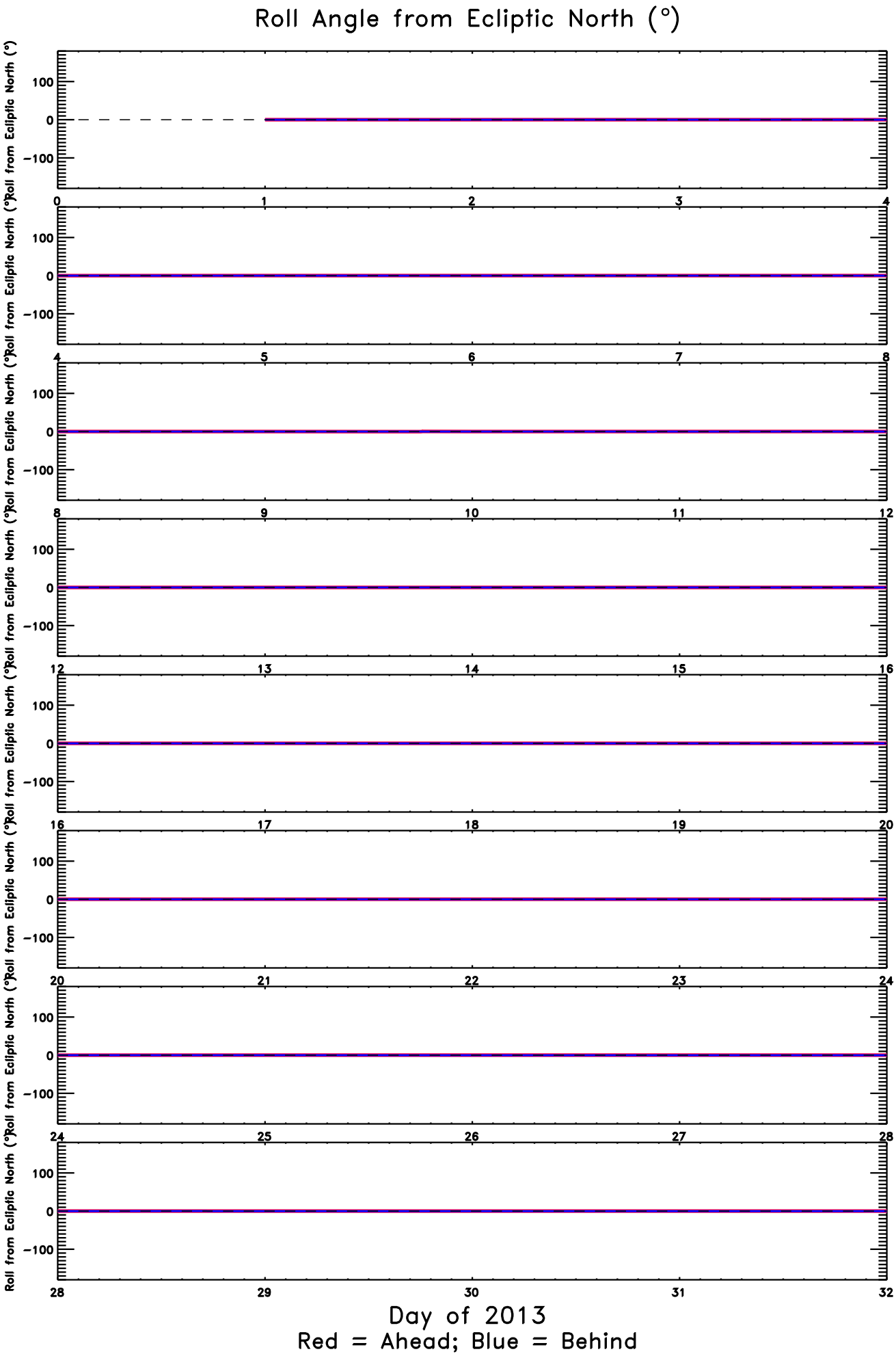
Day of 2012
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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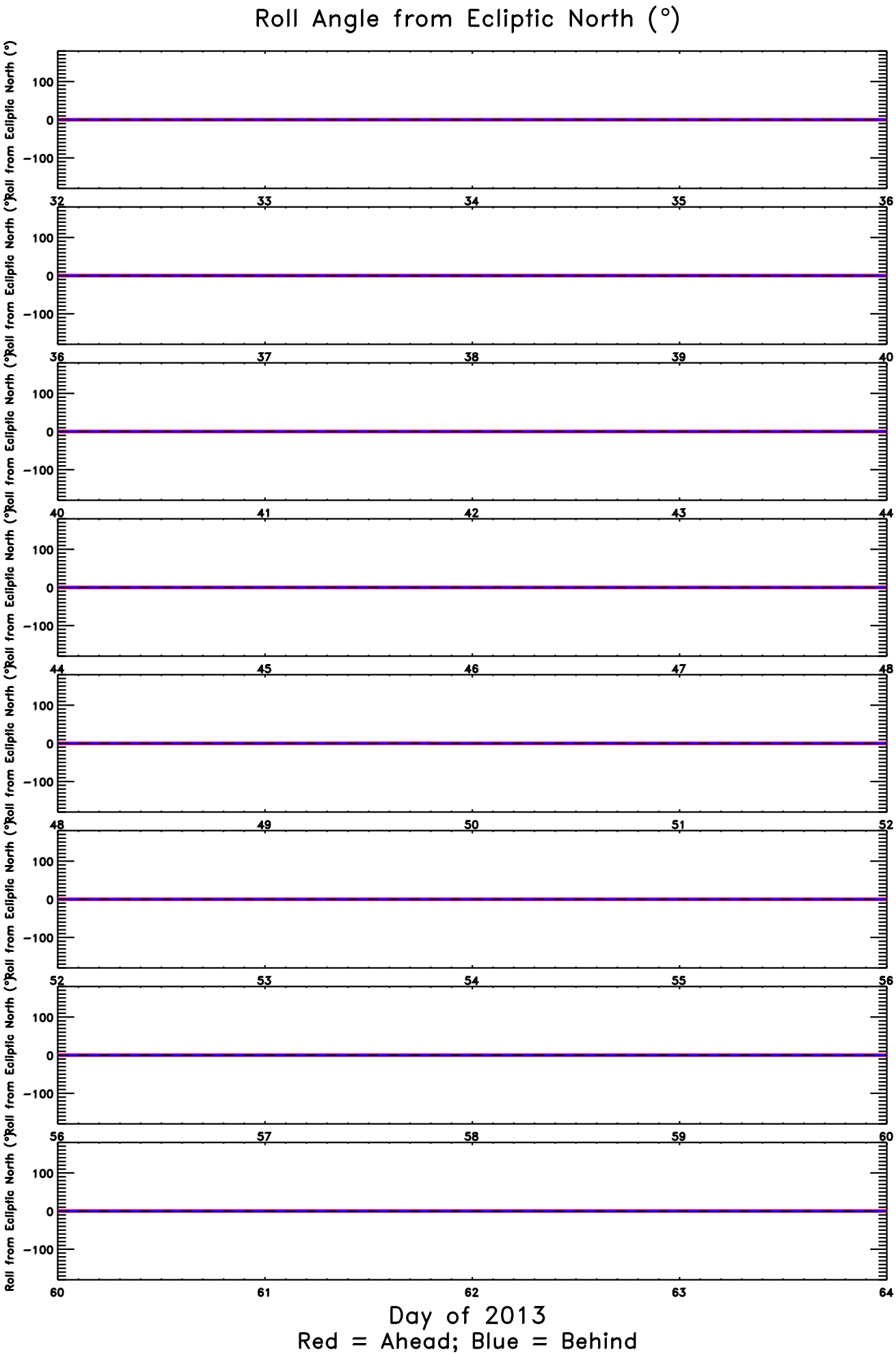
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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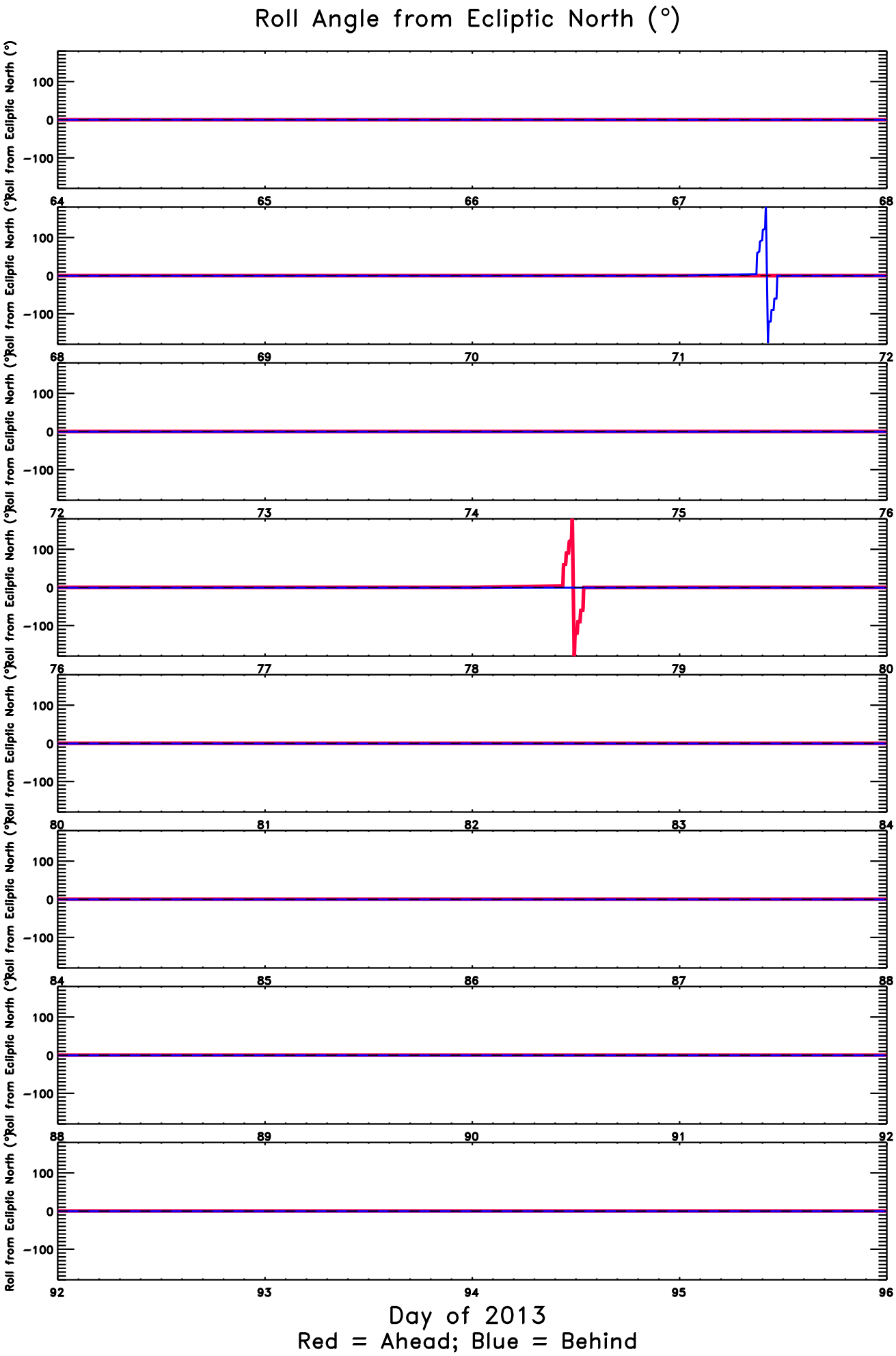
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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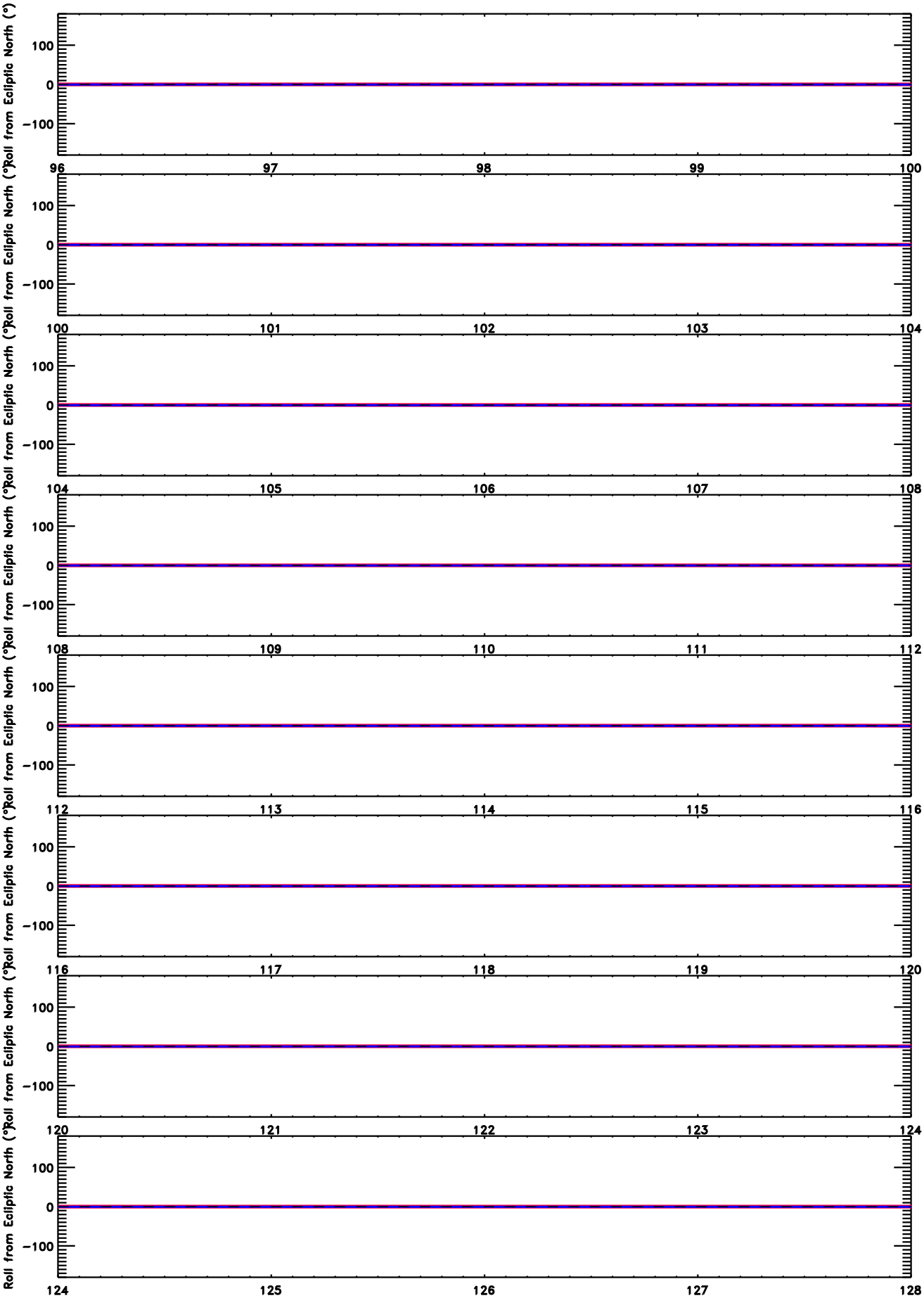
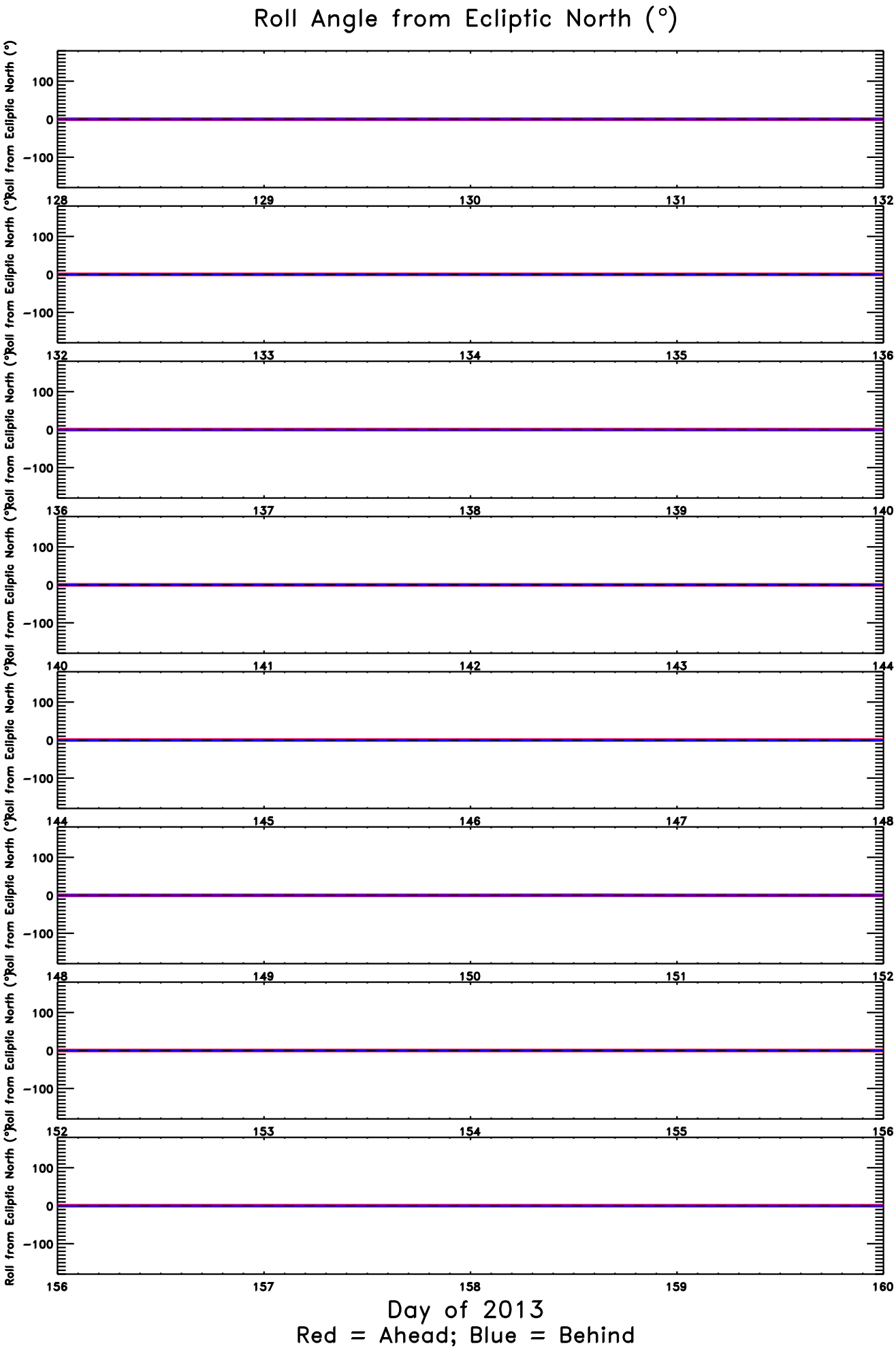
Day of 2013
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2013

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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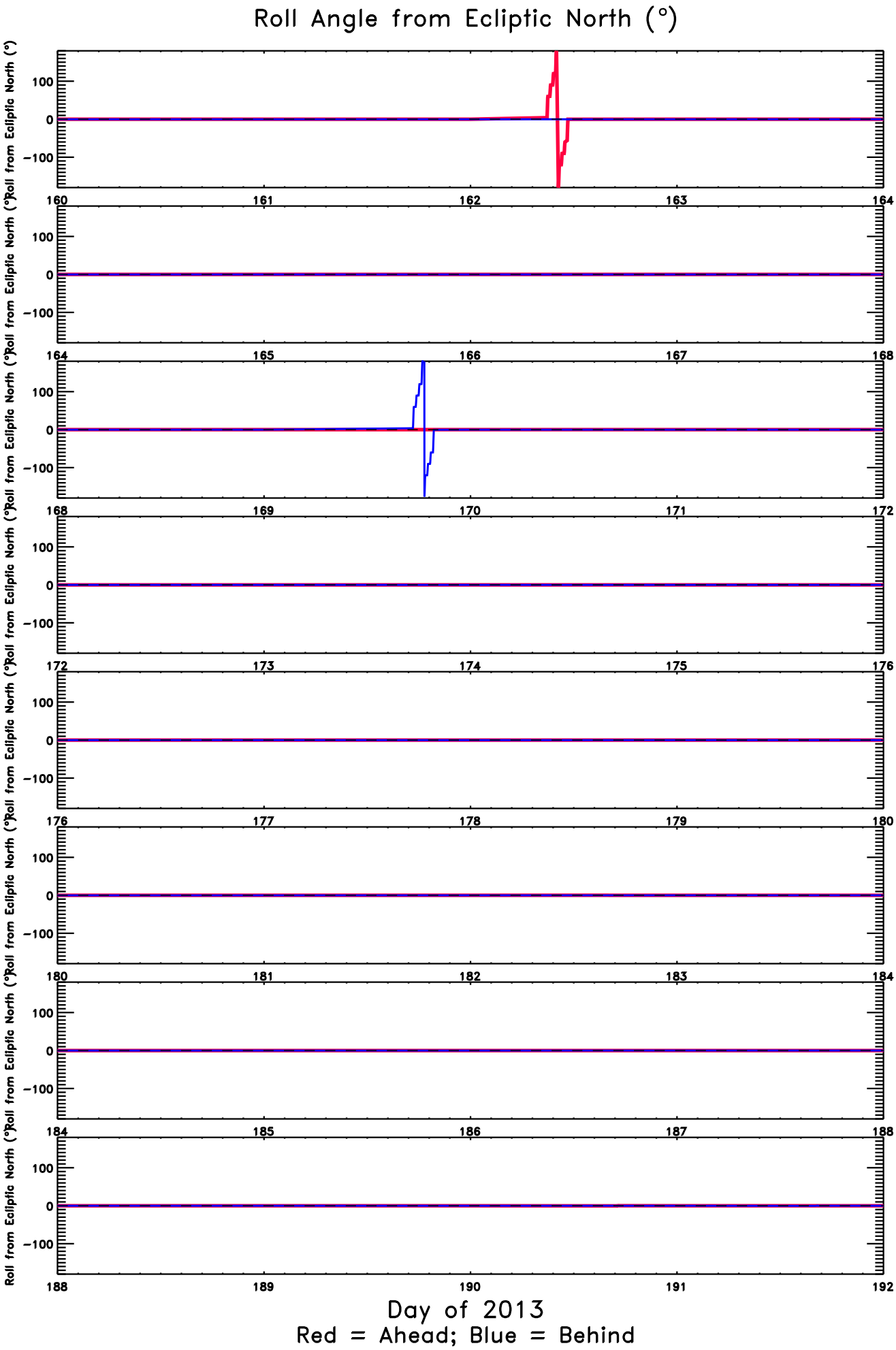
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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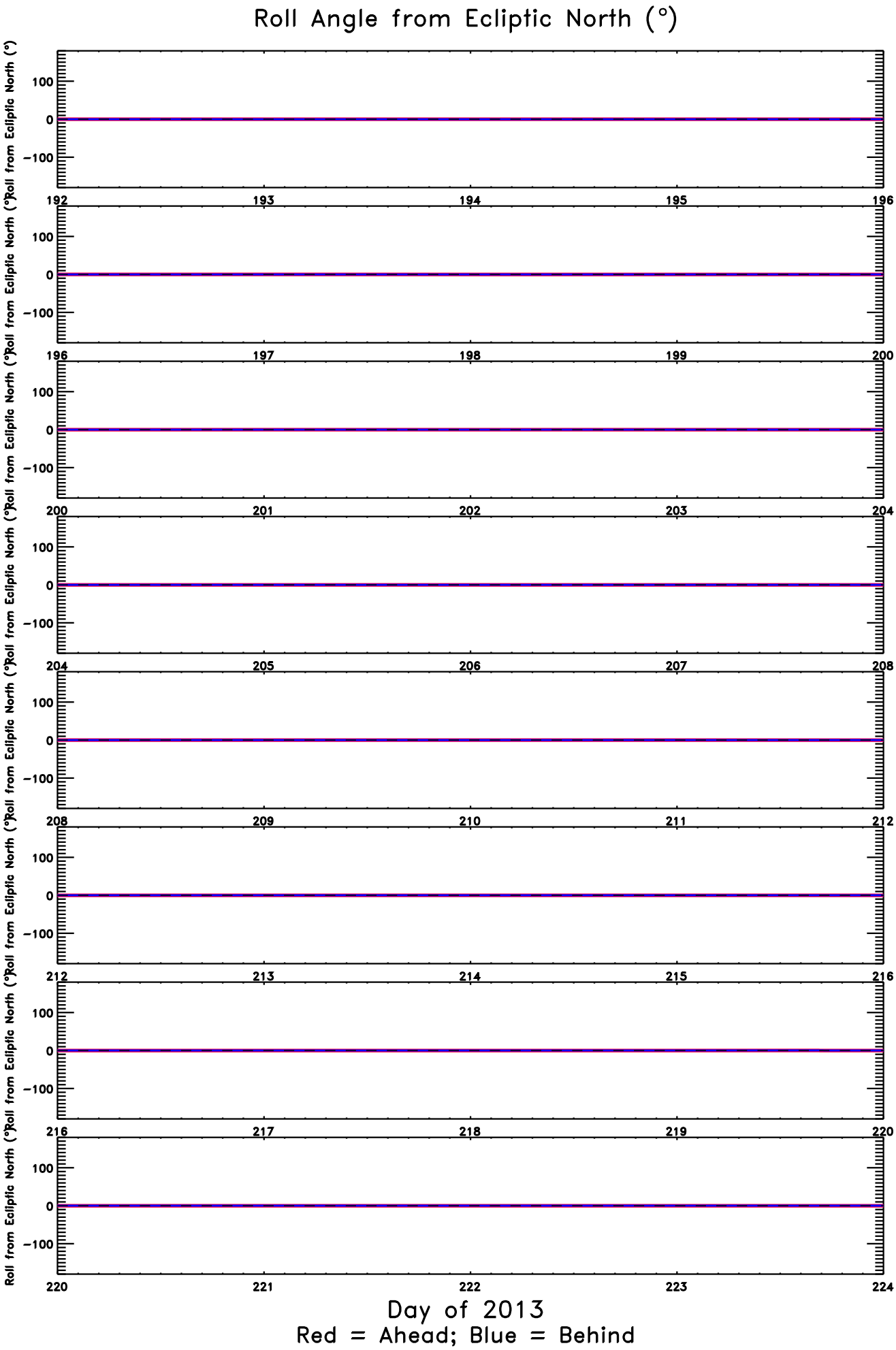
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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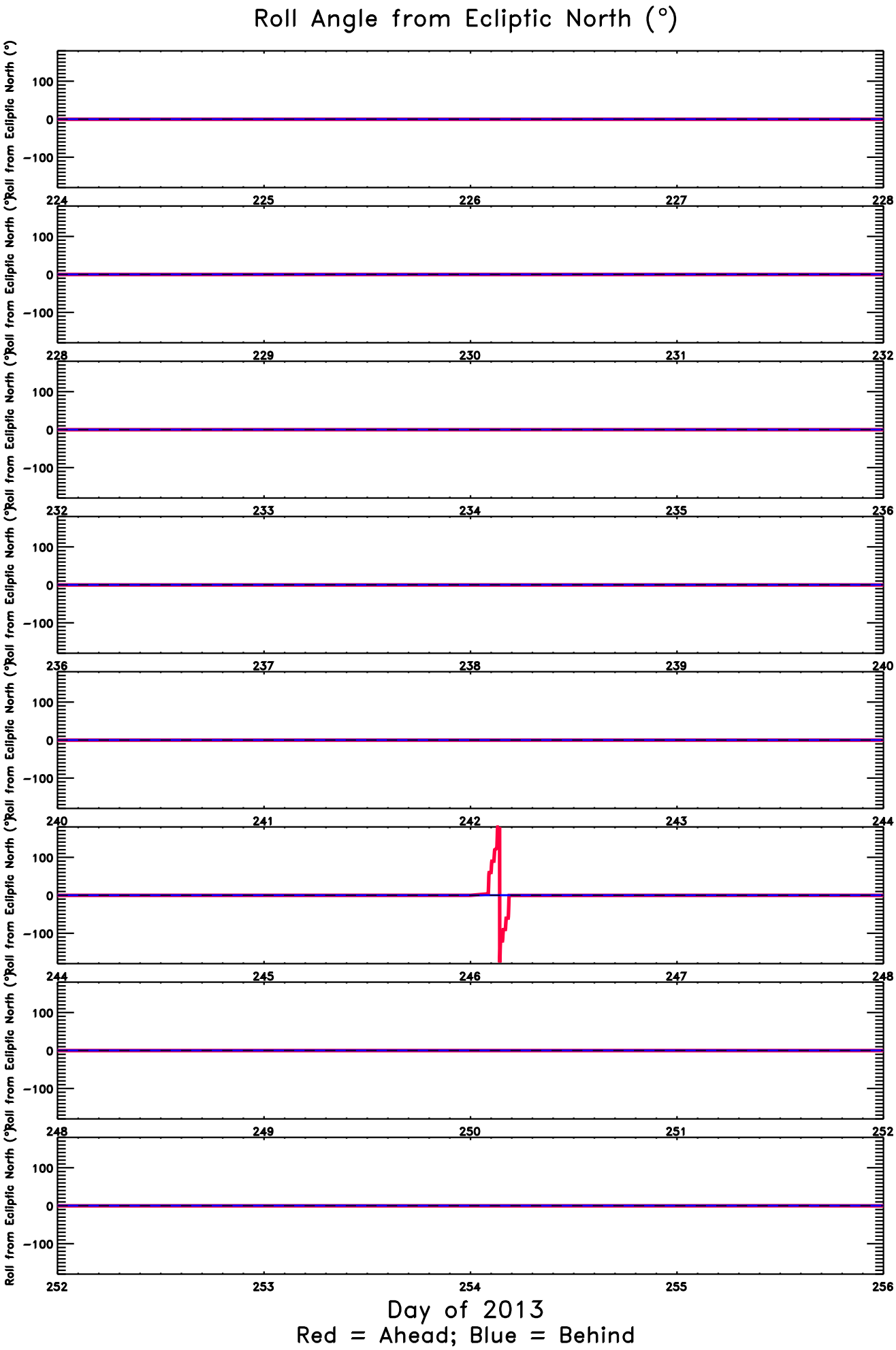
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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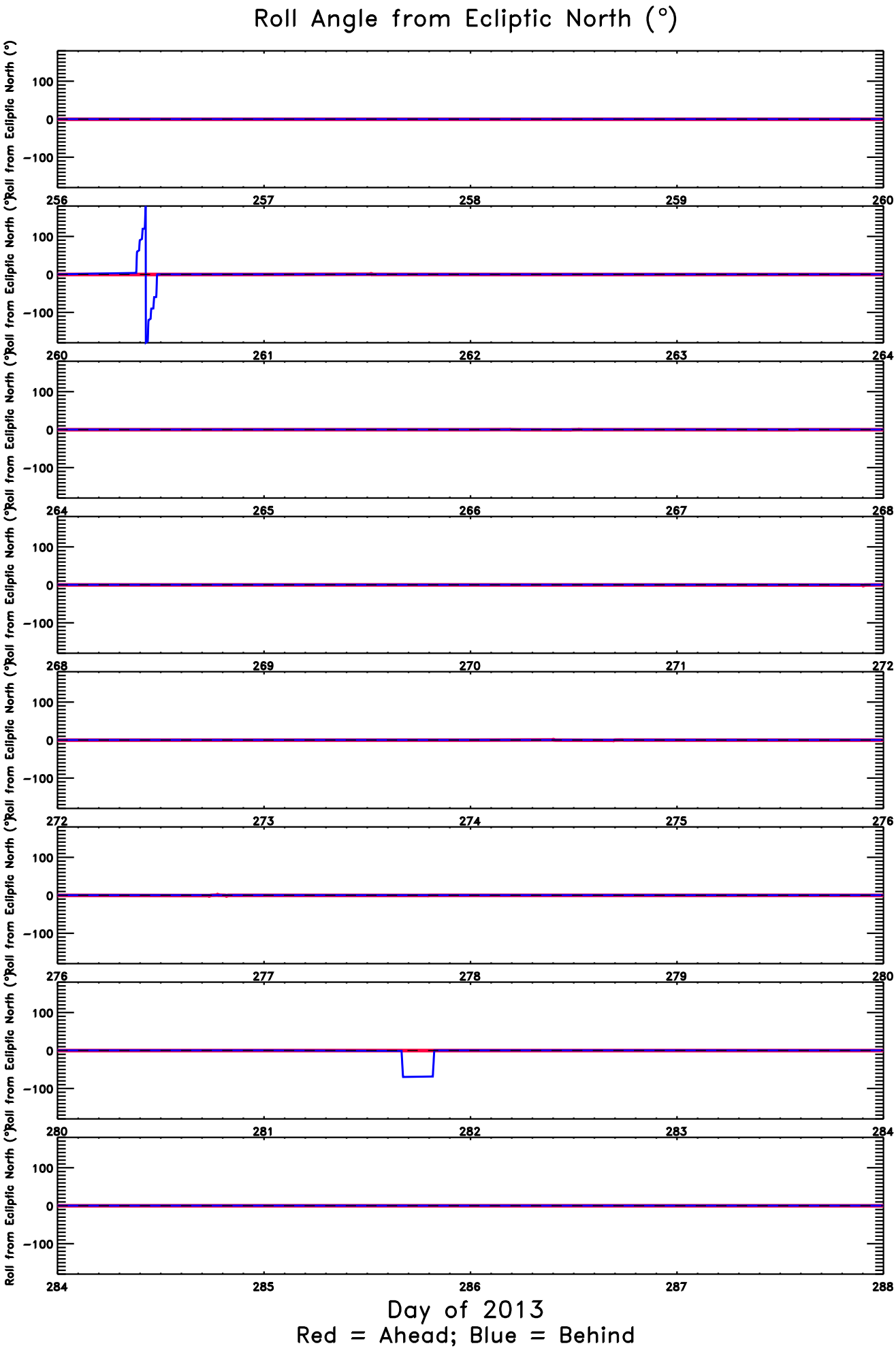
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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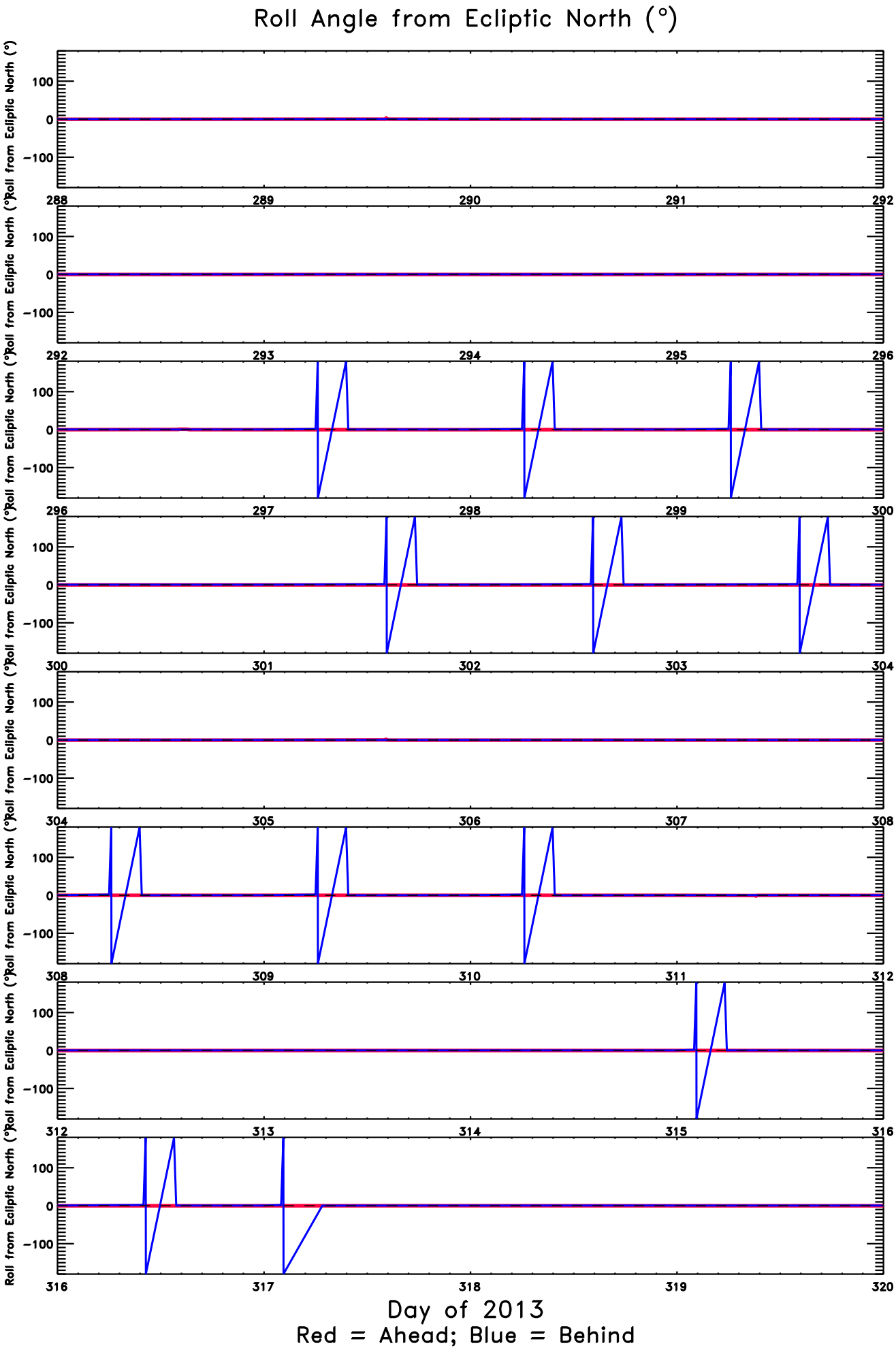
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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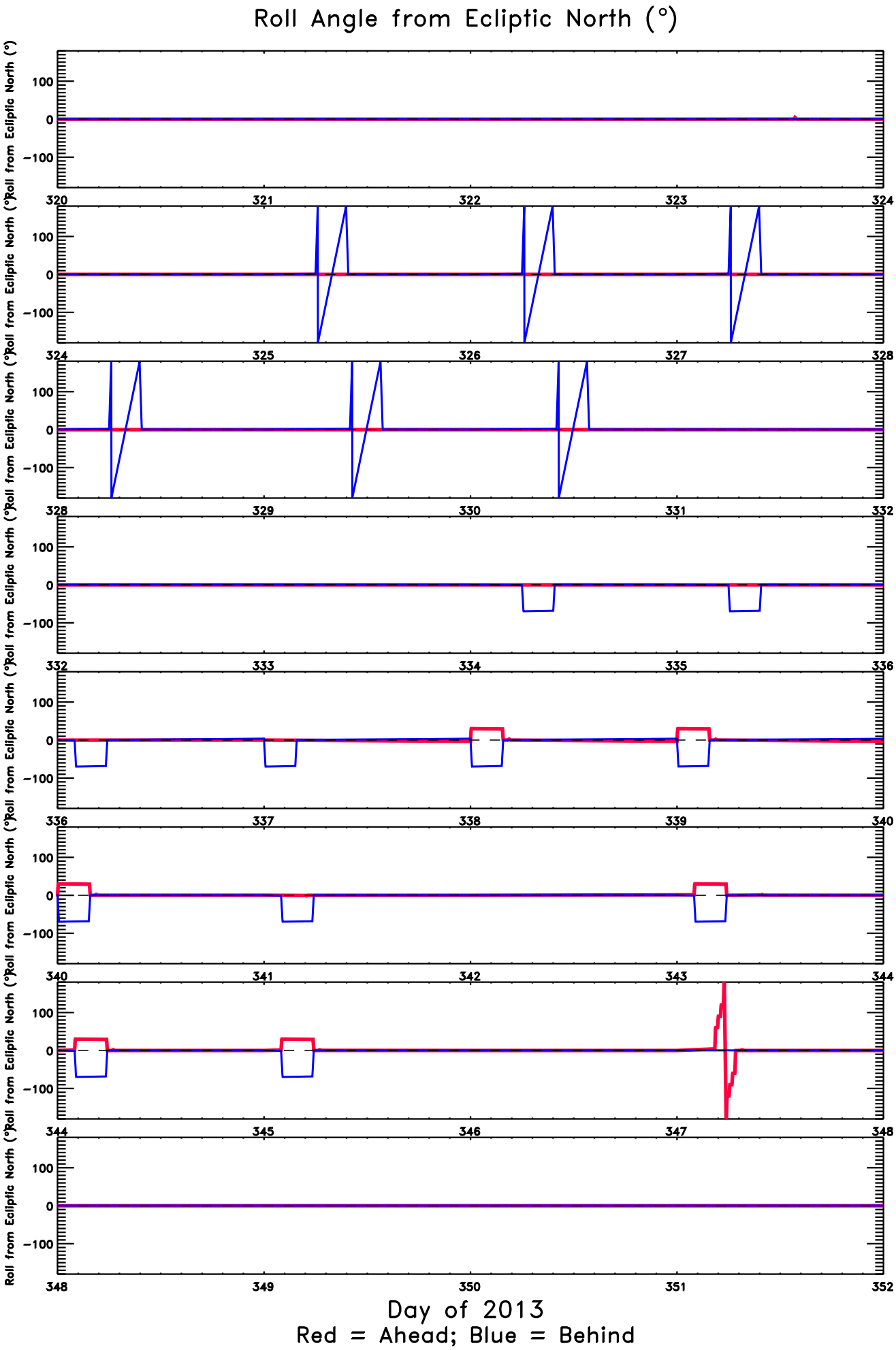
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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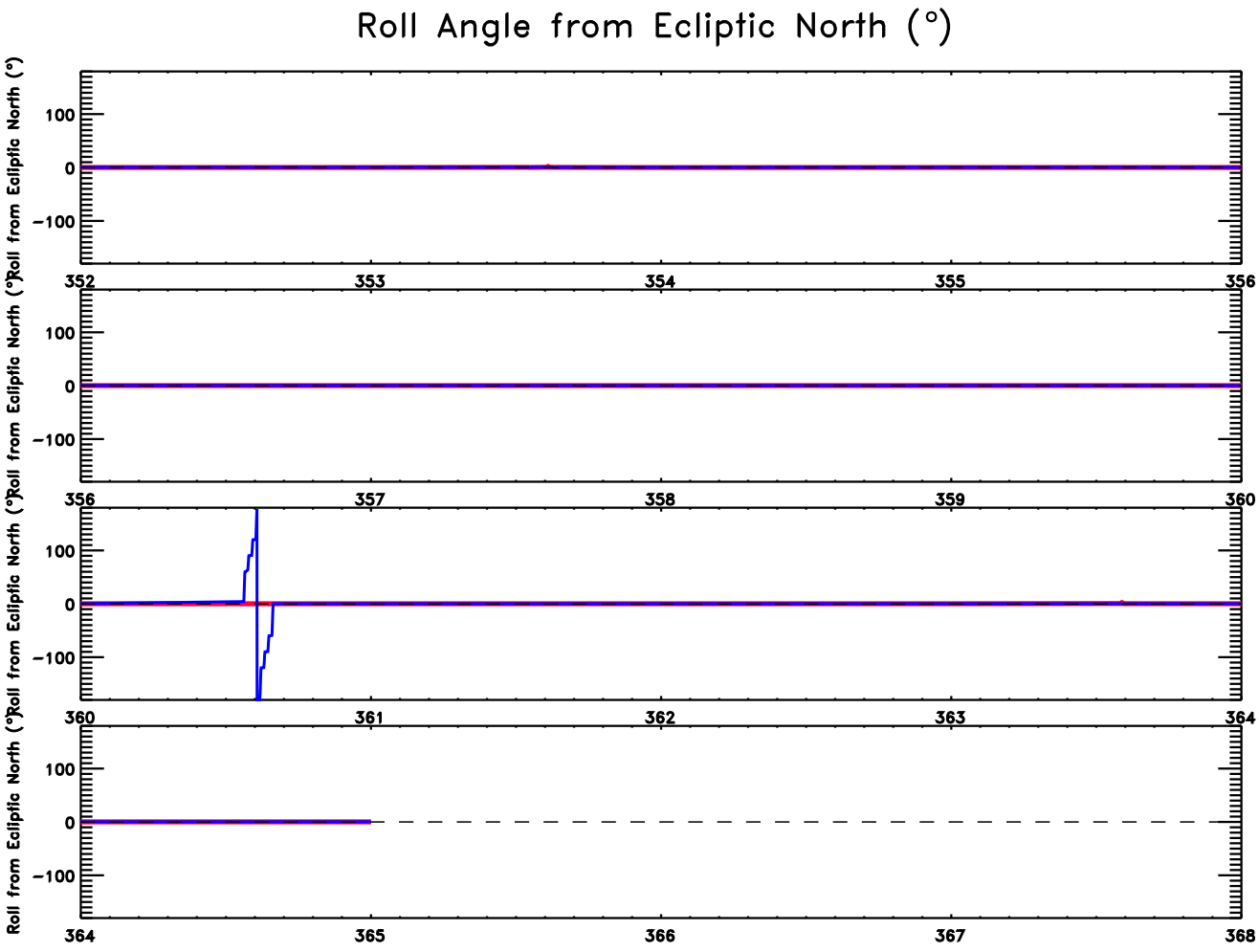
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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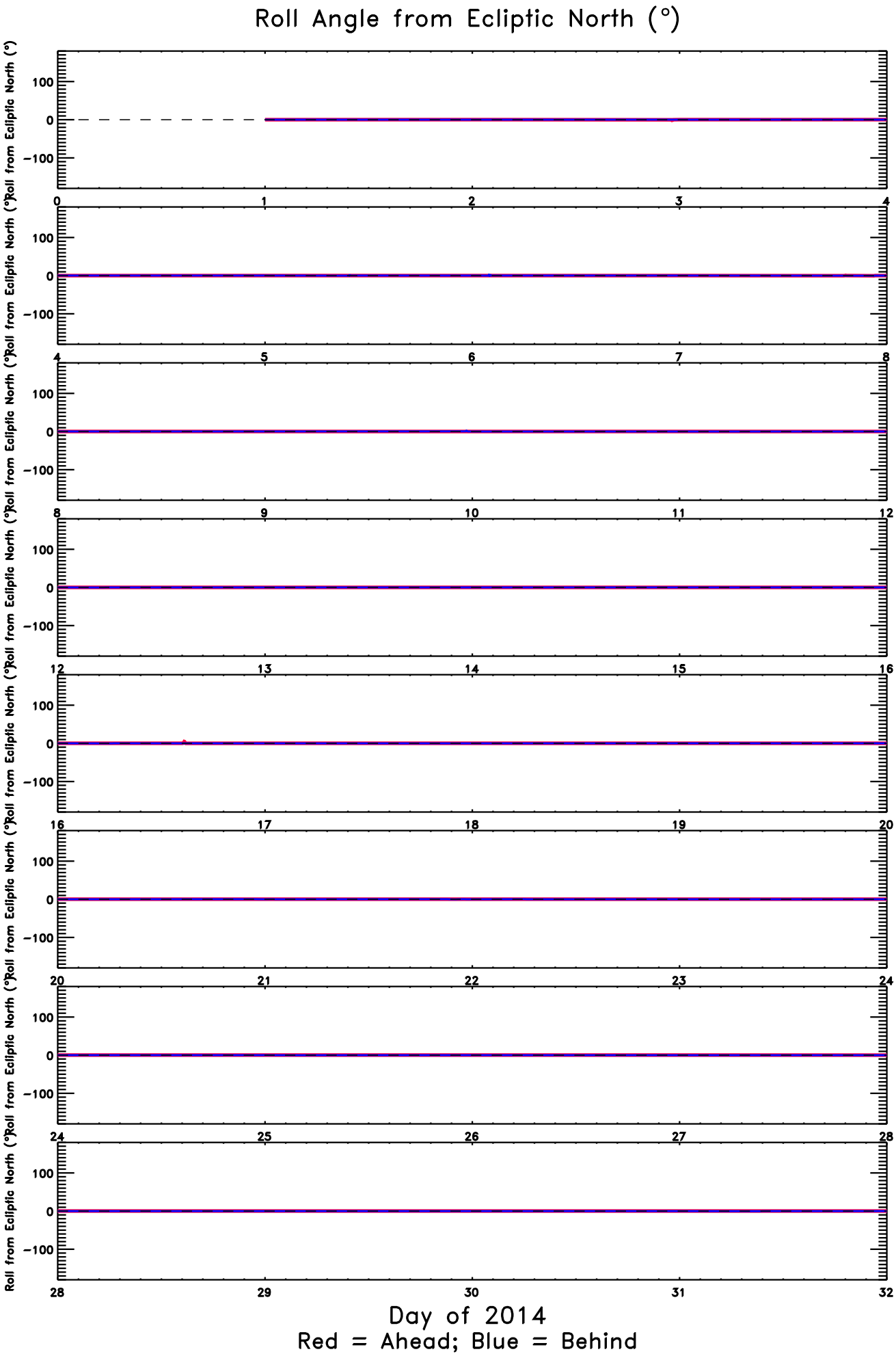
Day of 2013
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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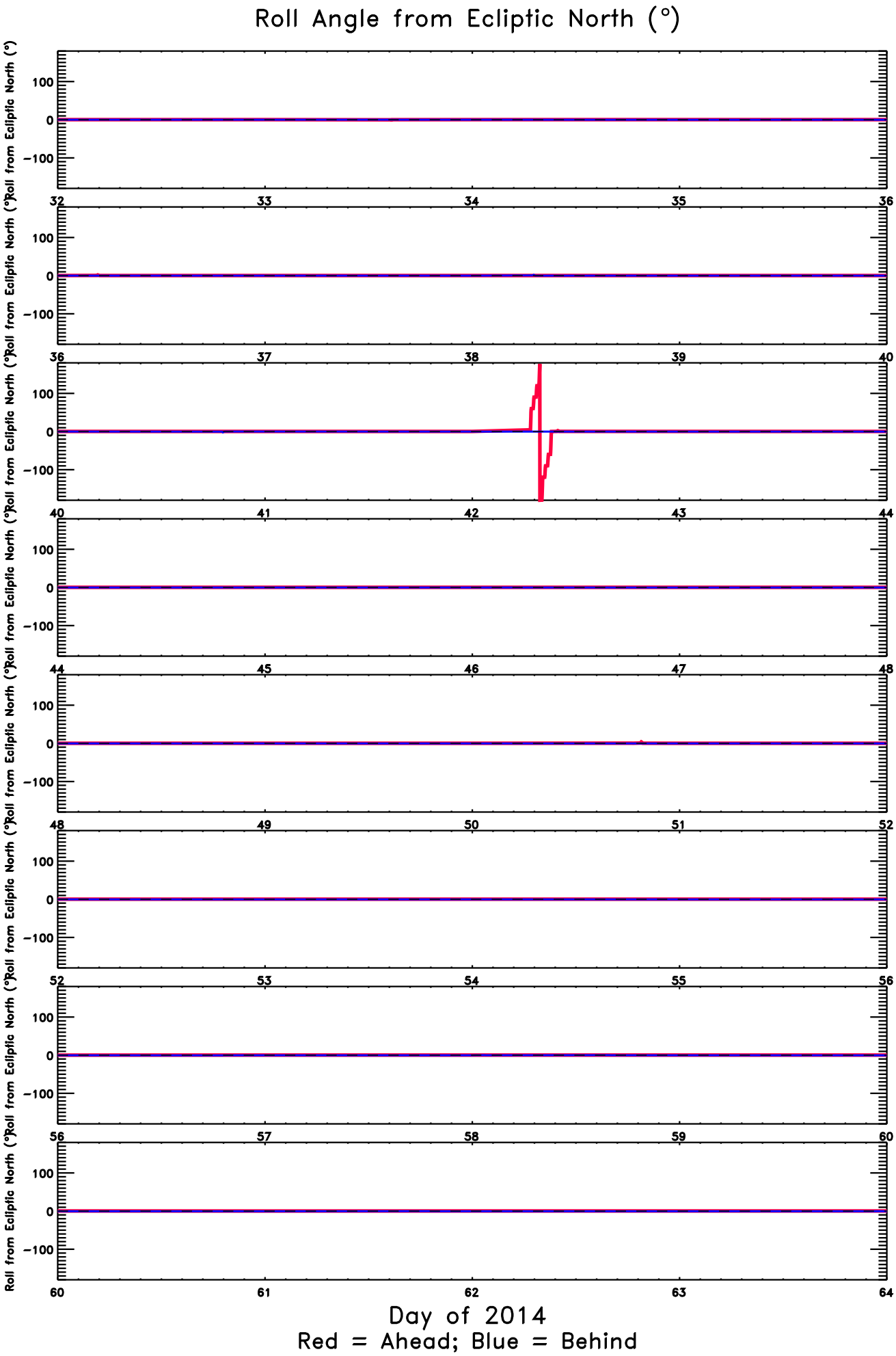
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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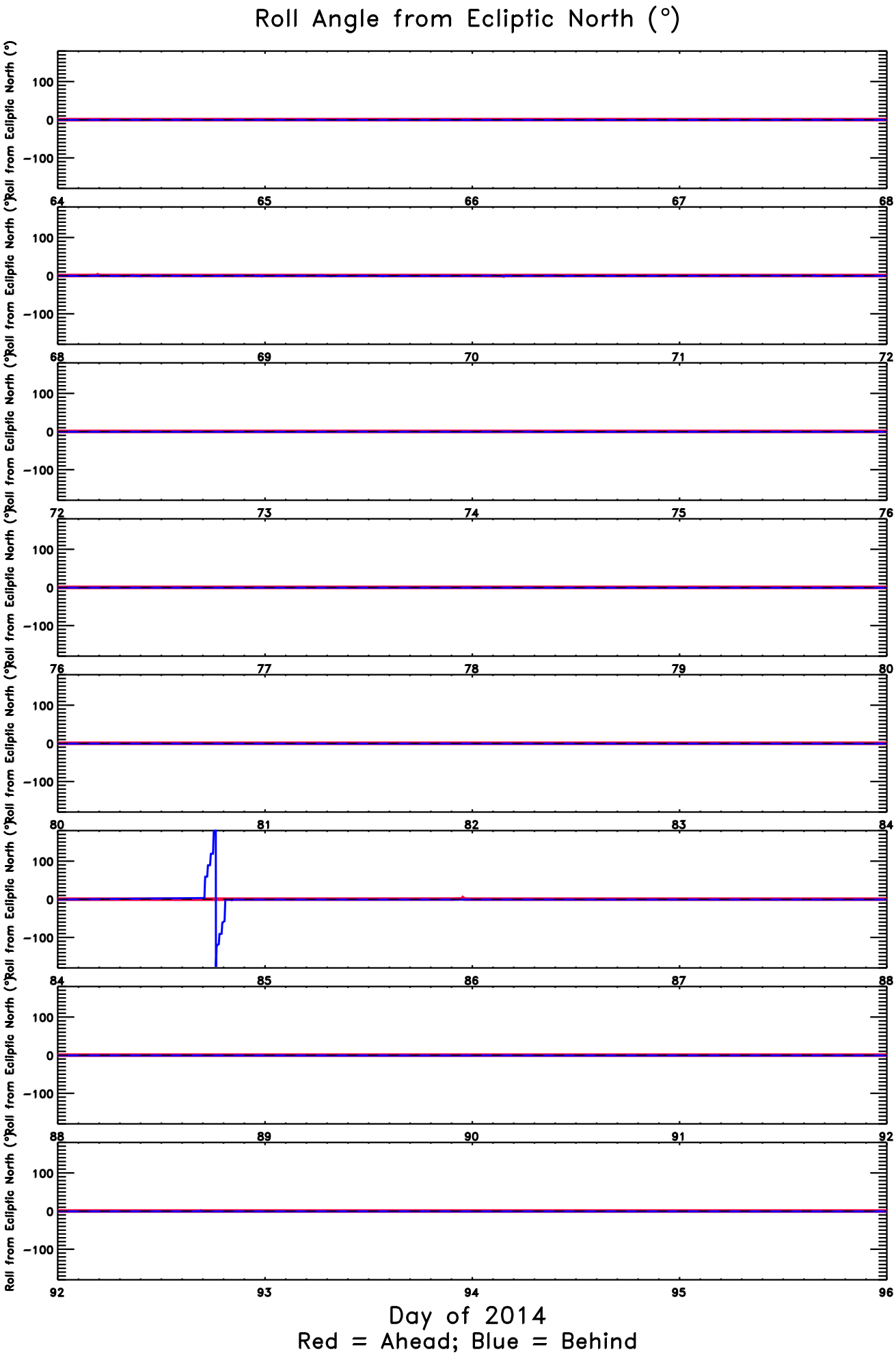
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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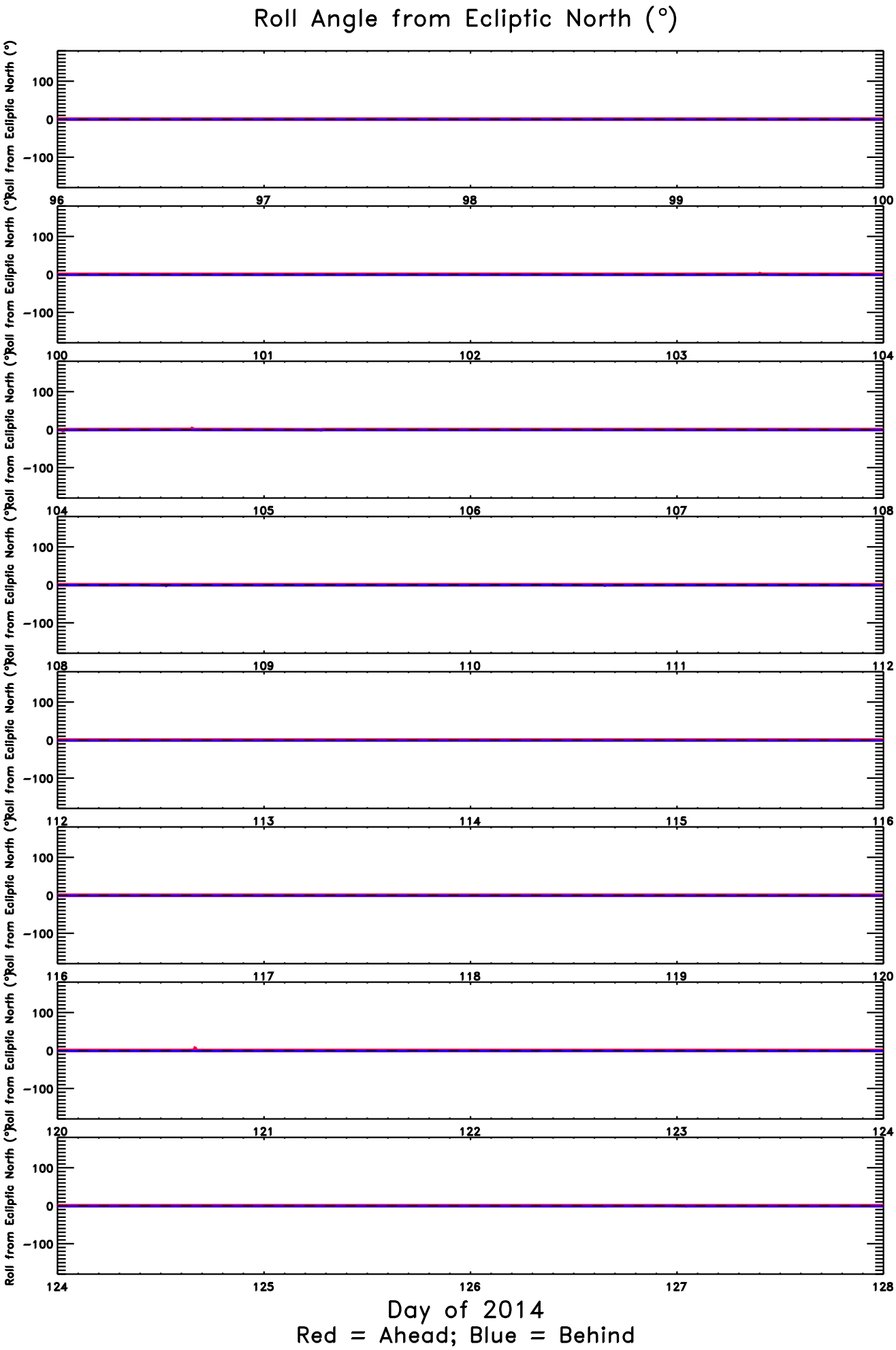
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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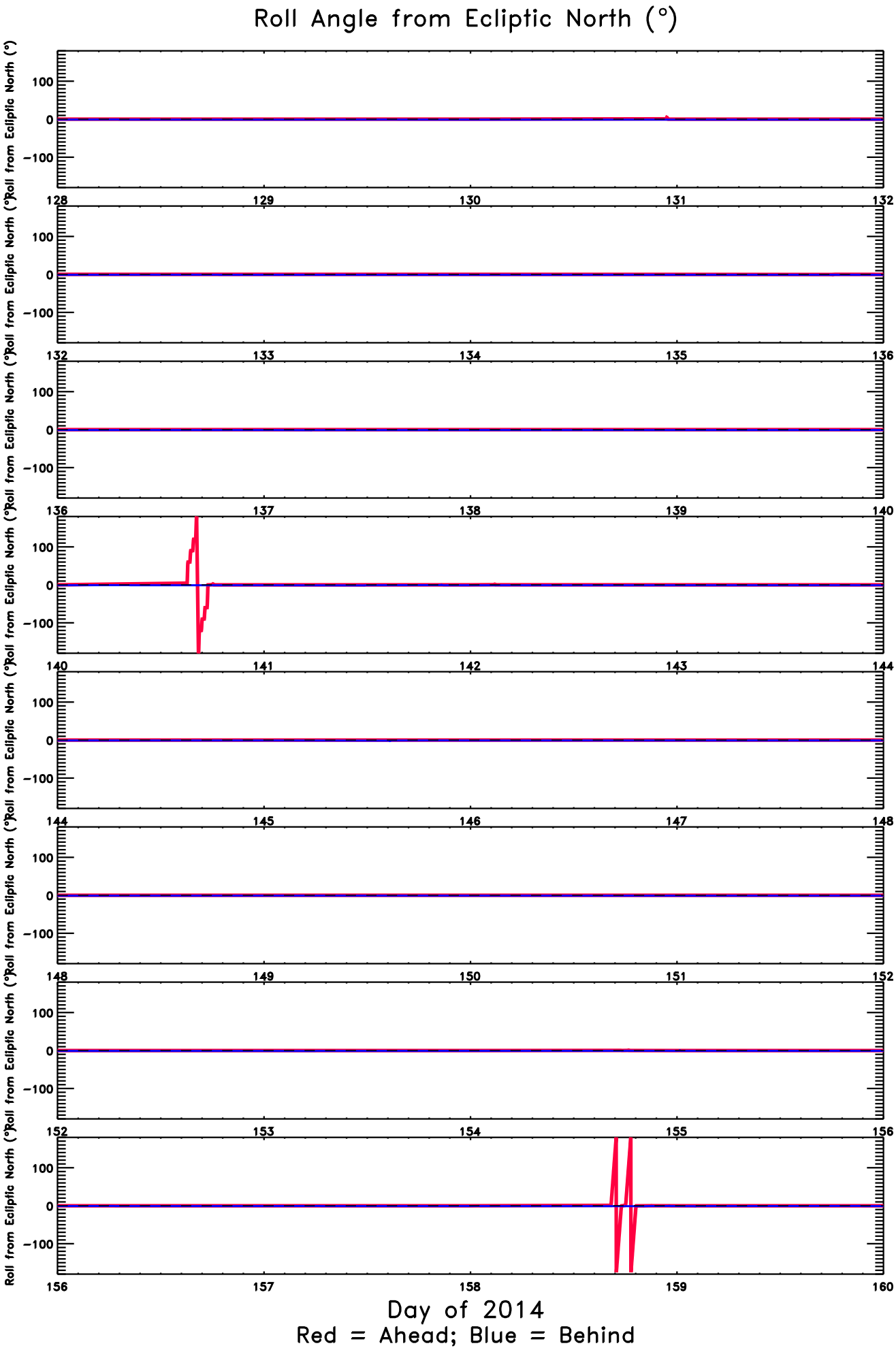
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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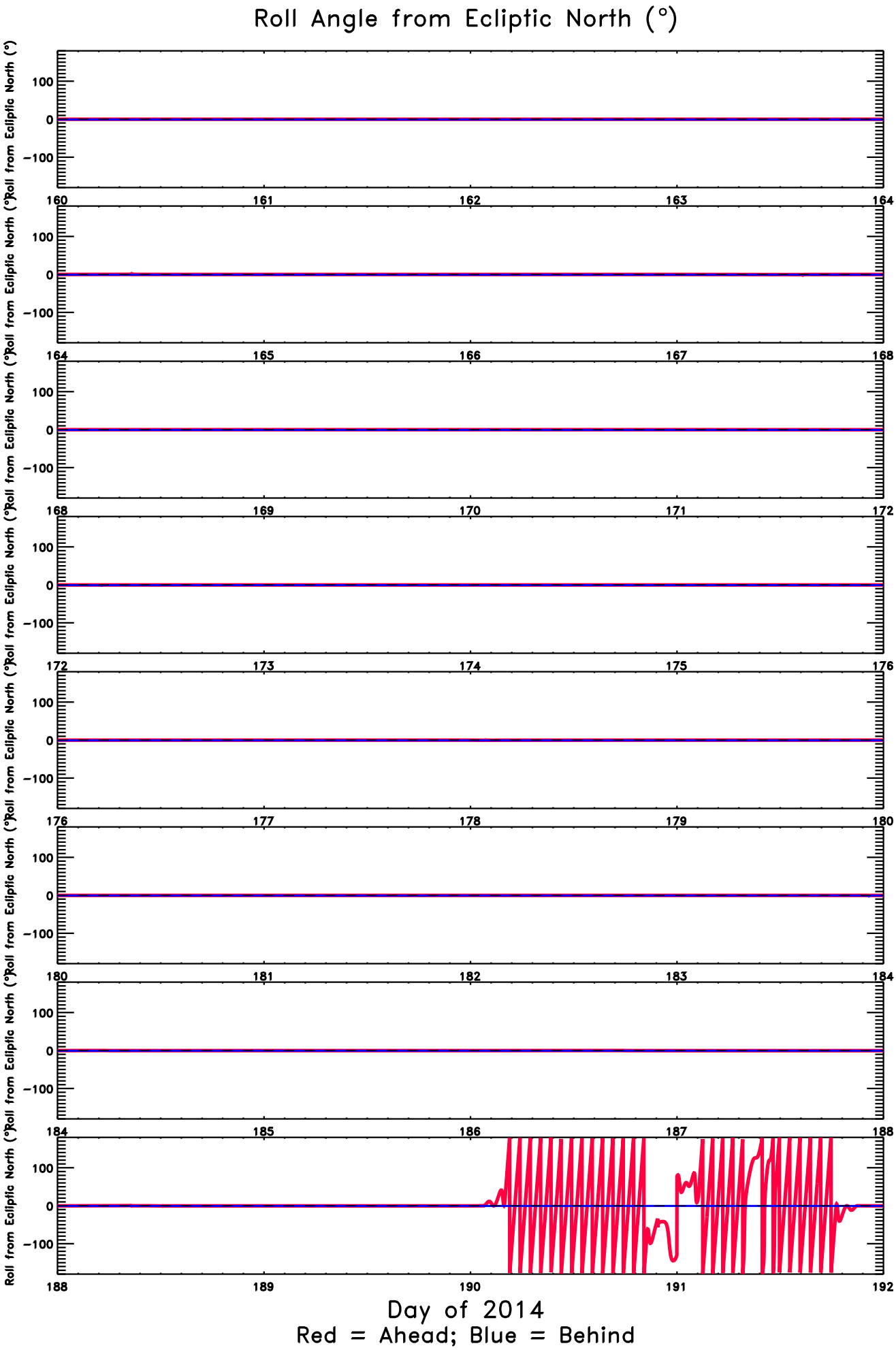
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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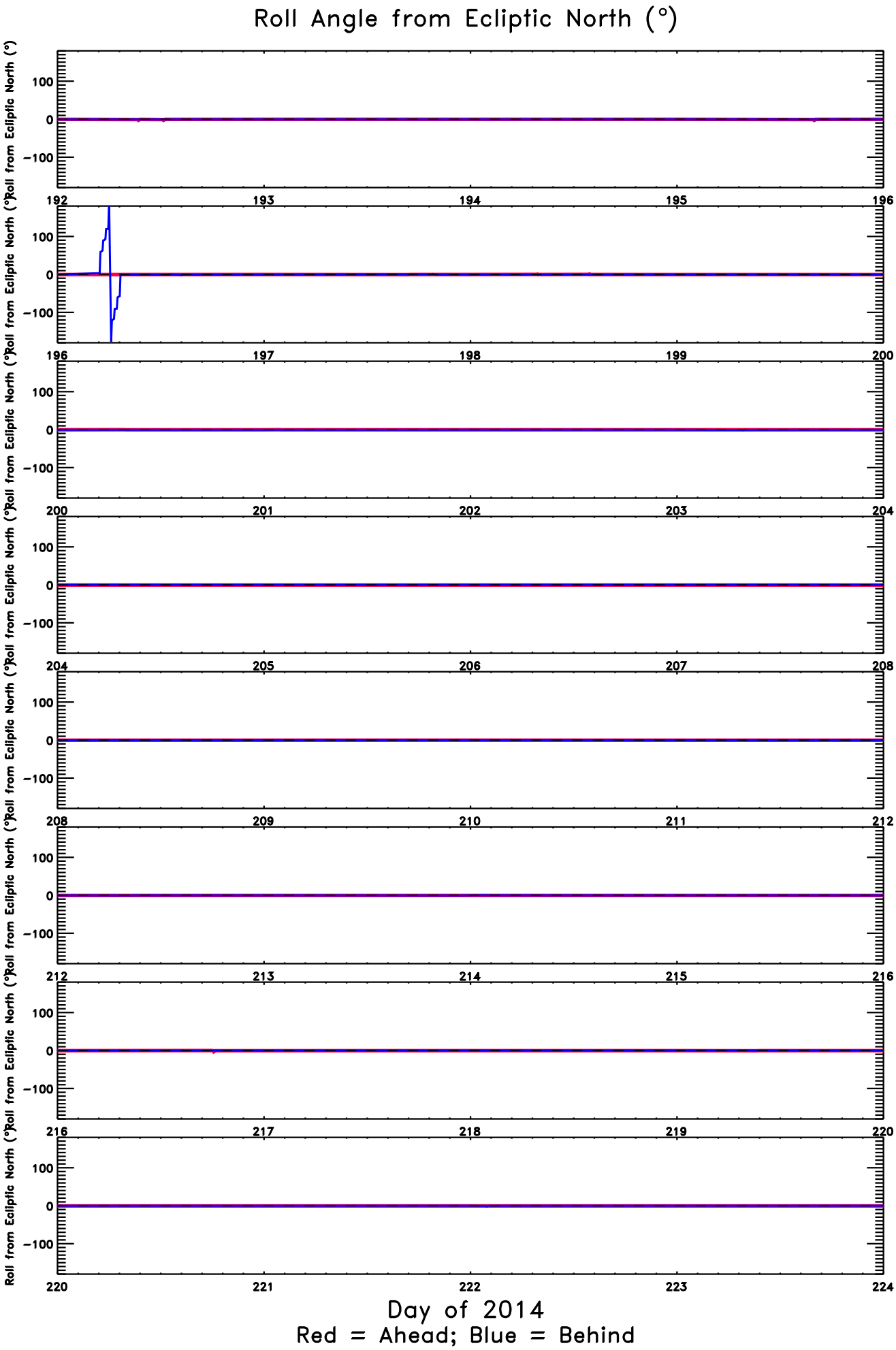
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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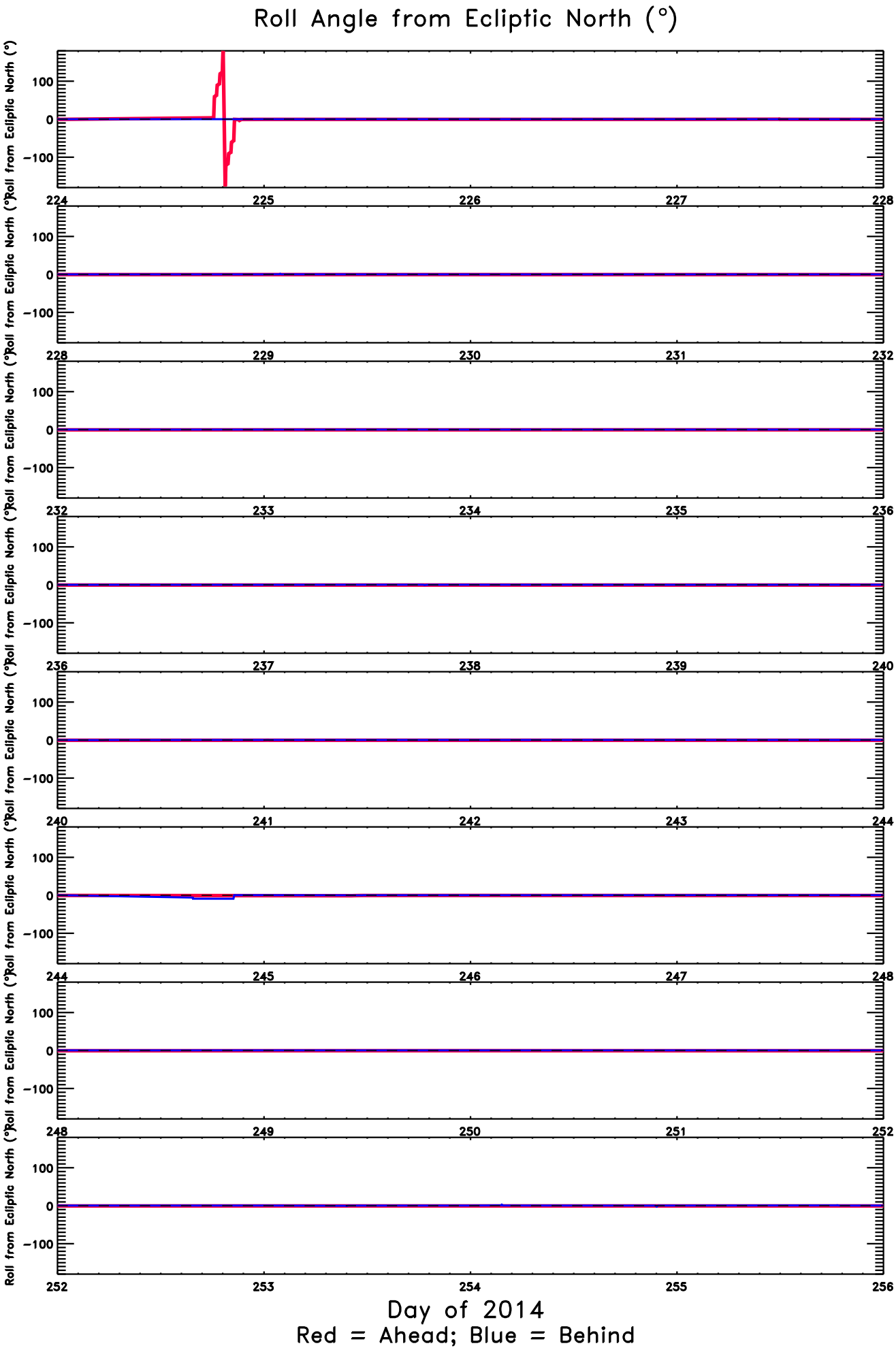
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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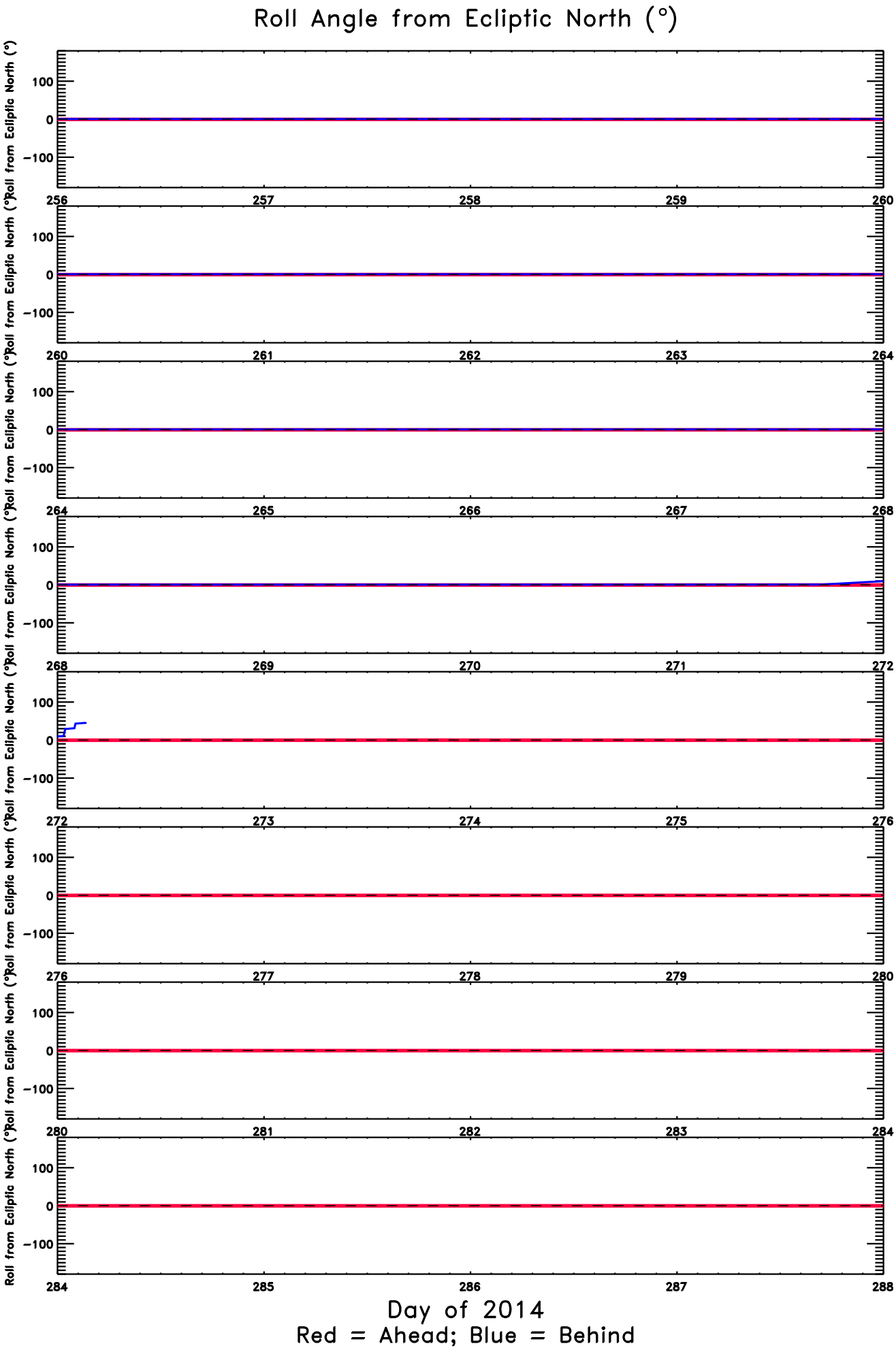
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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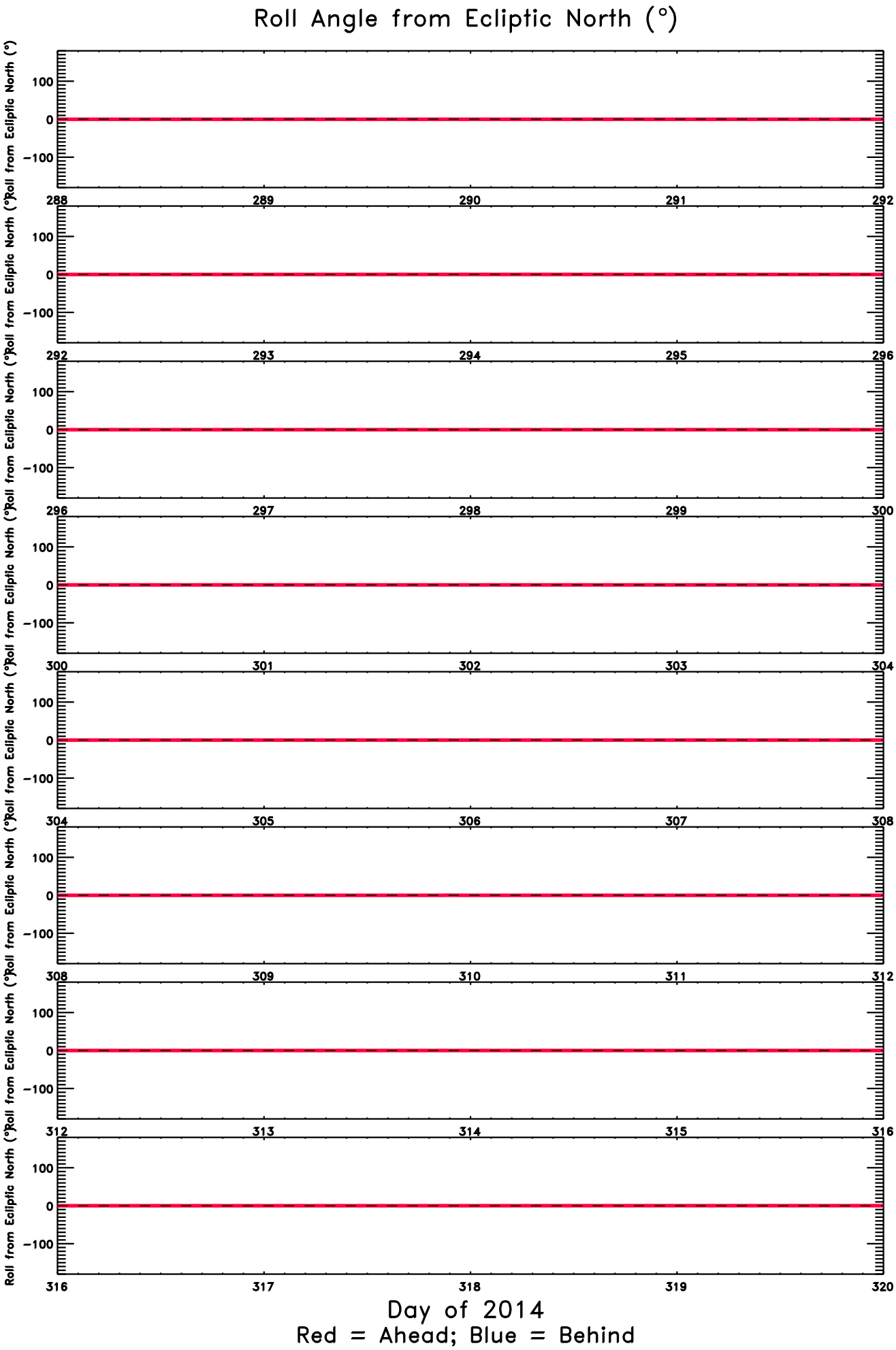
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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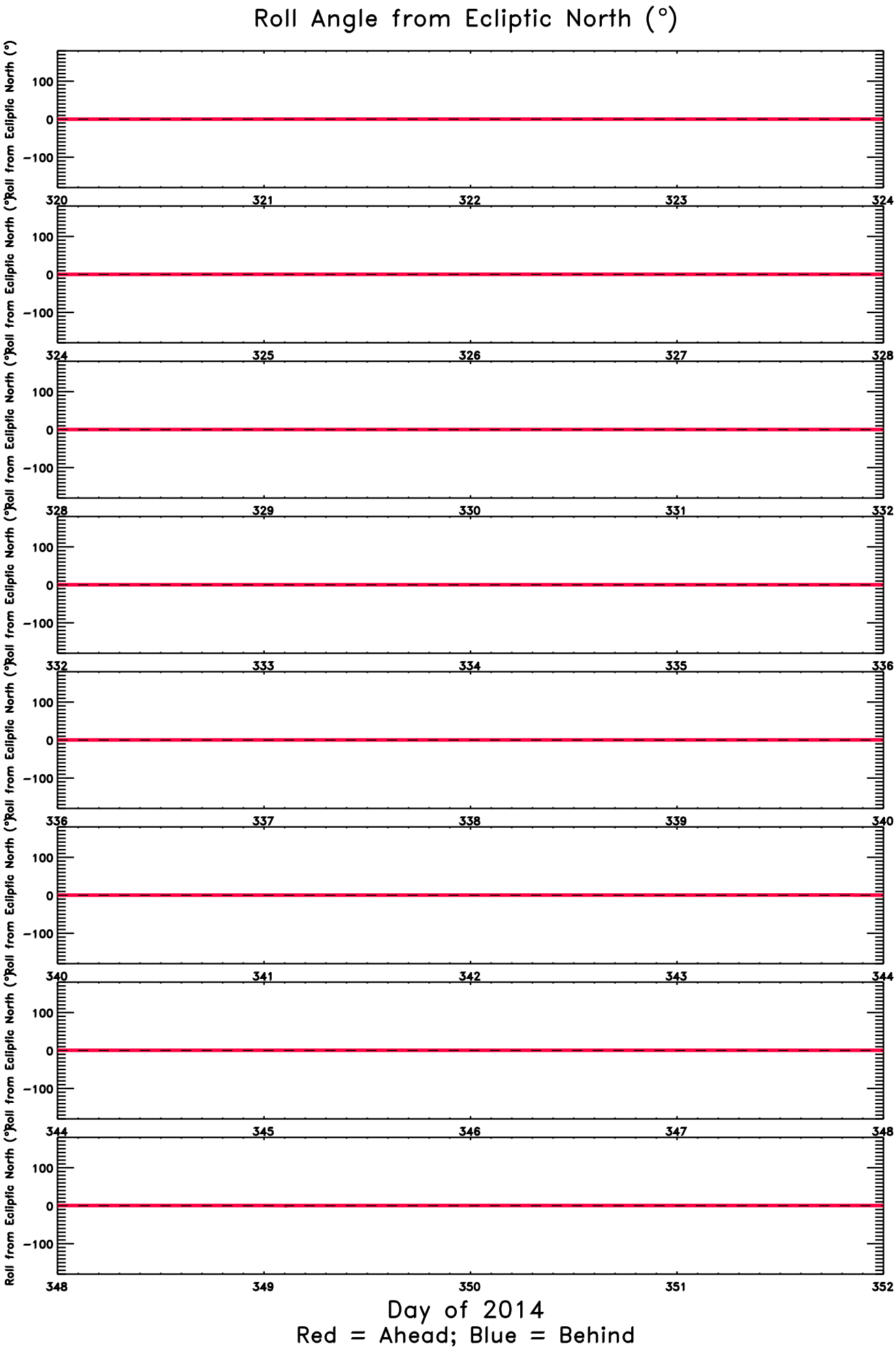
Day of 2014
Red = Ahead; Blue = Behind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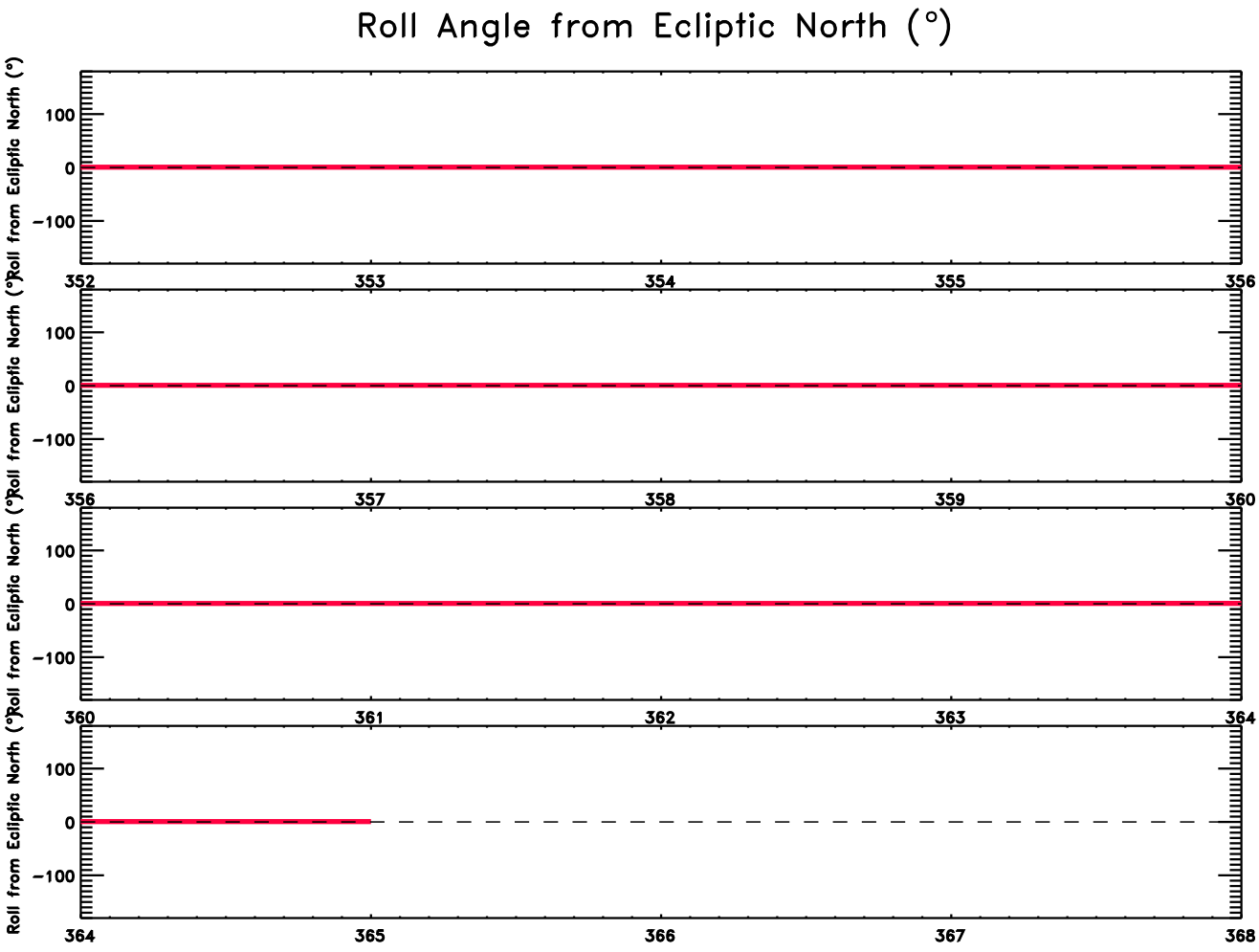
Day of 2014
Red = Ahead; Blue = Behind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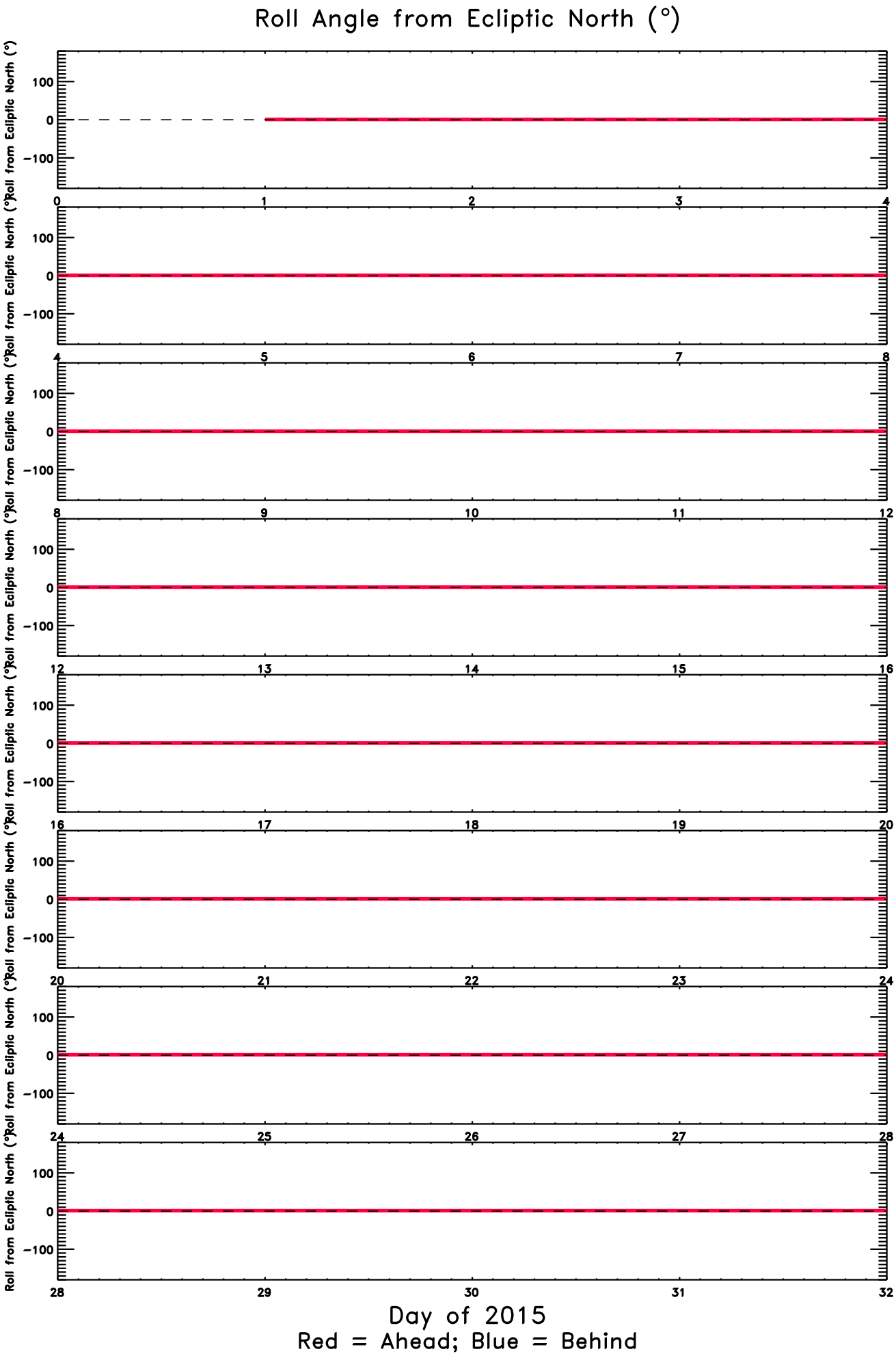
Day of 2014
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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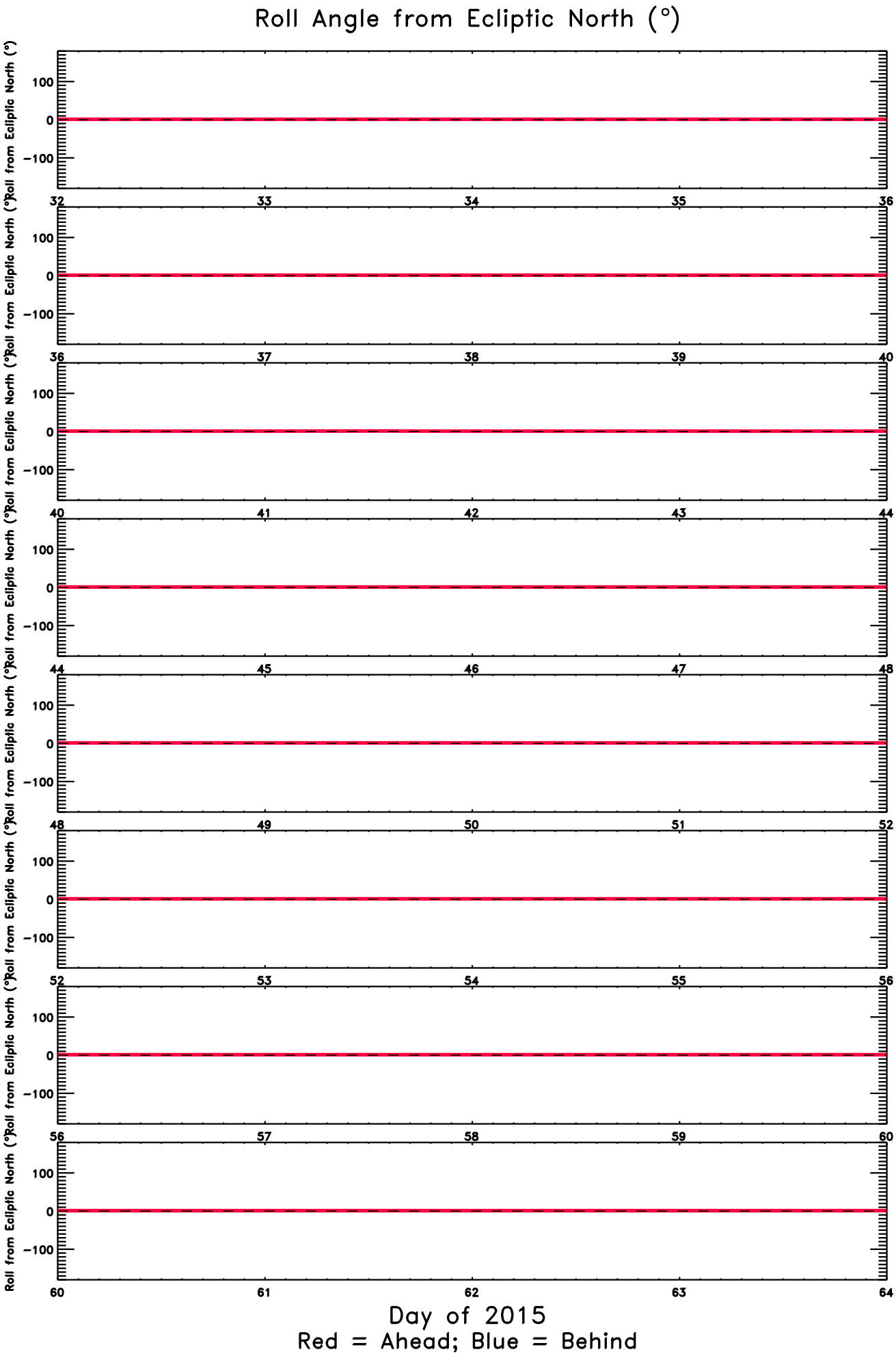
Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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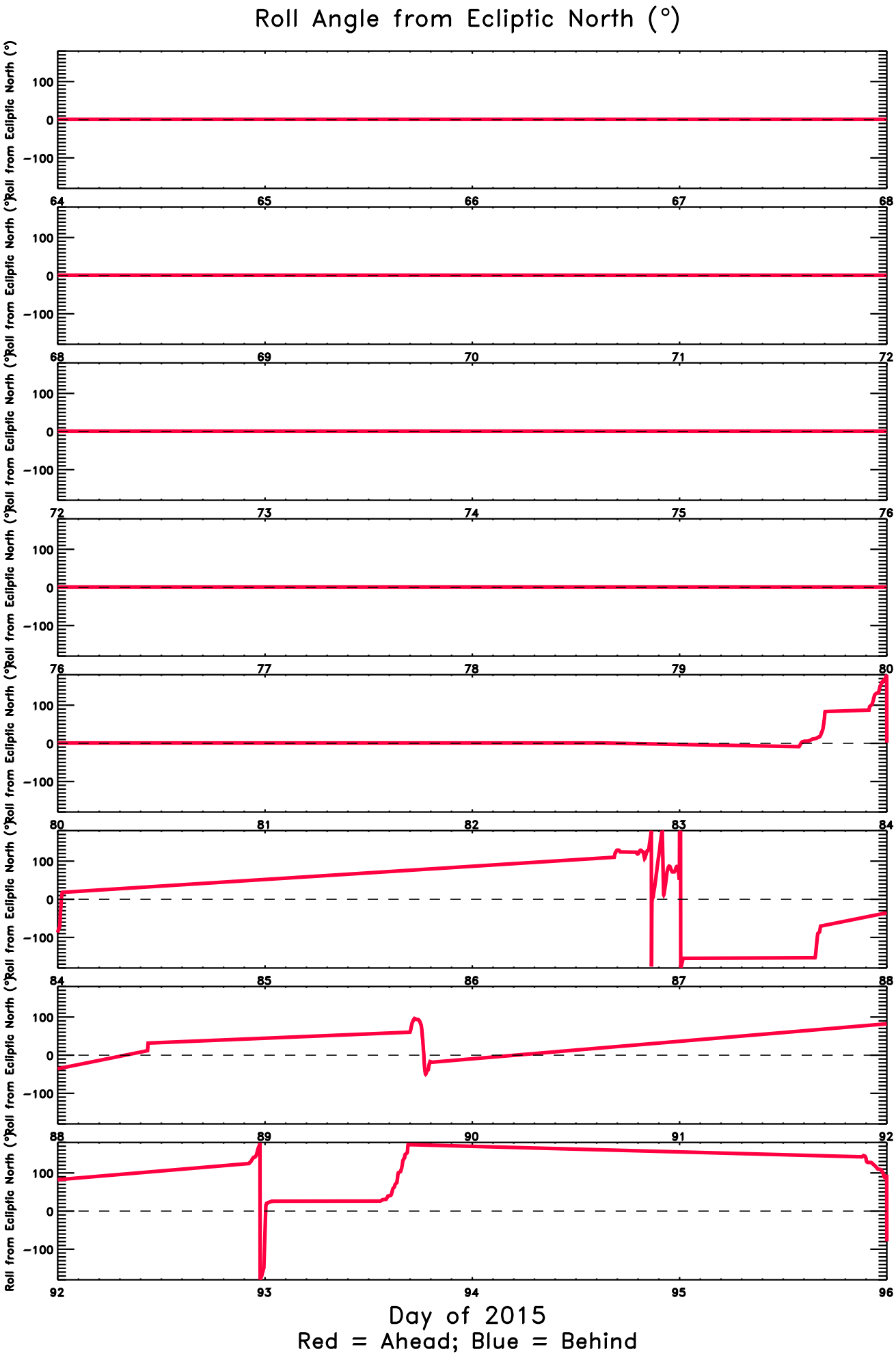
Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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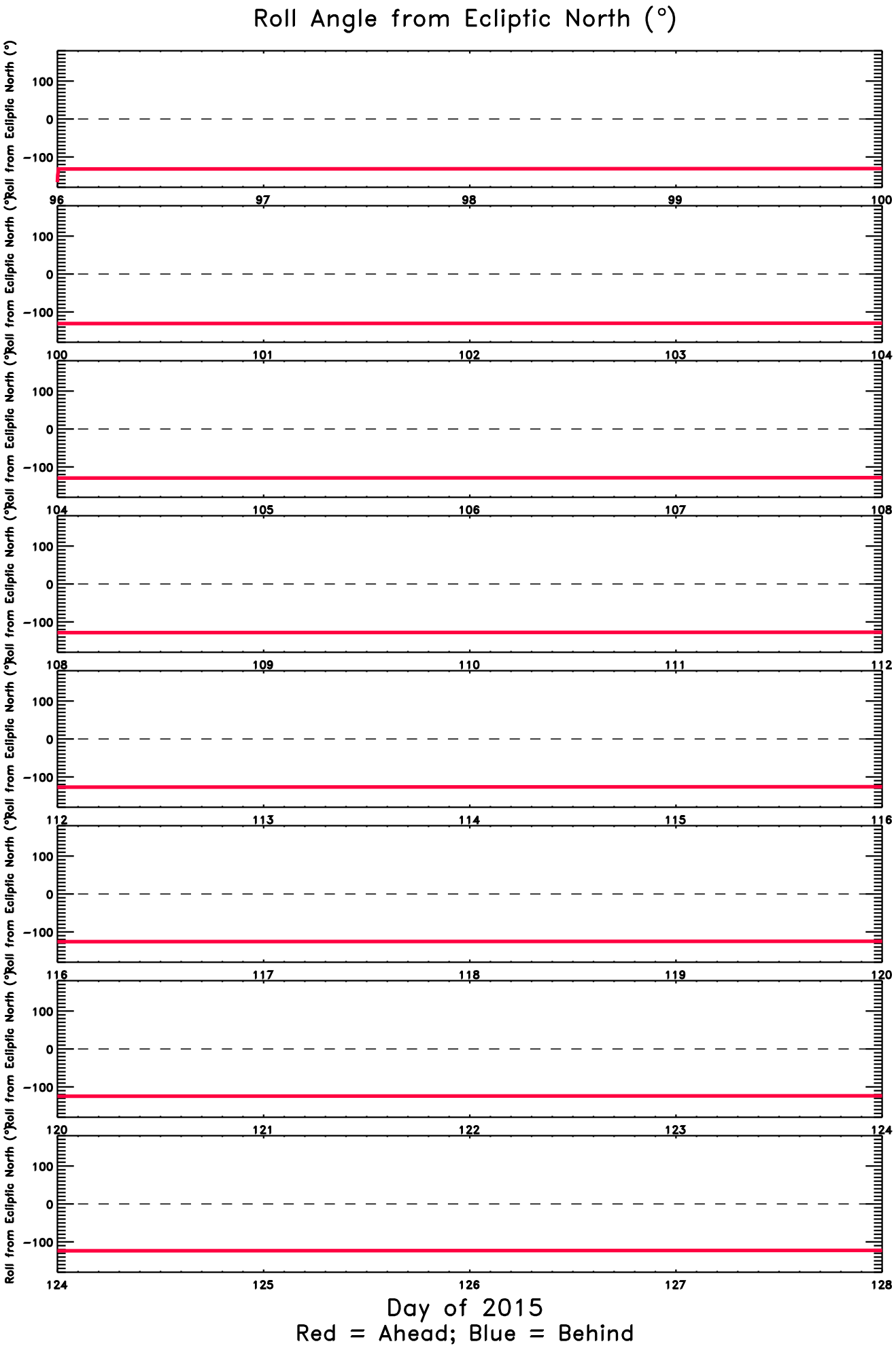
Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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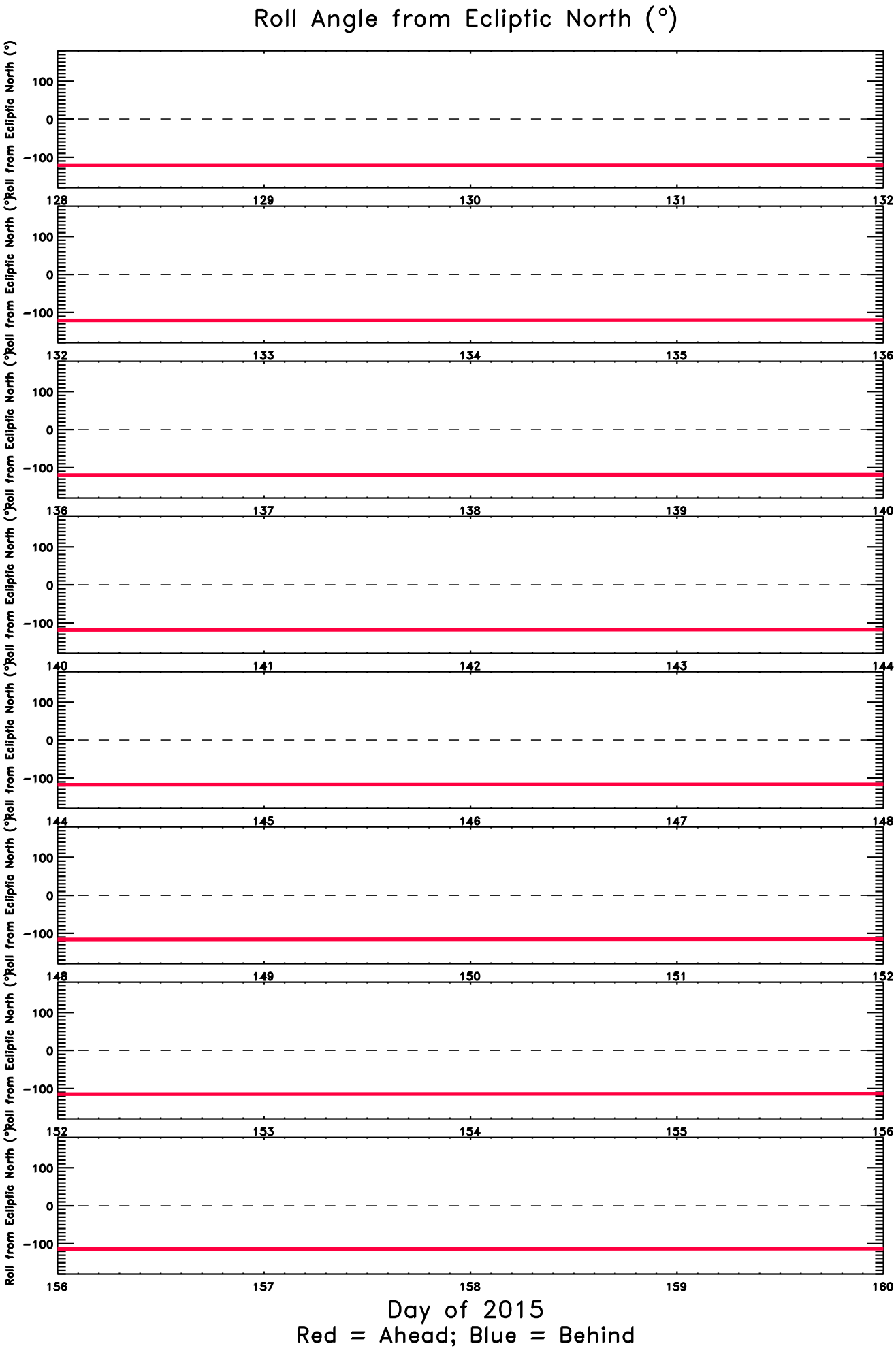
Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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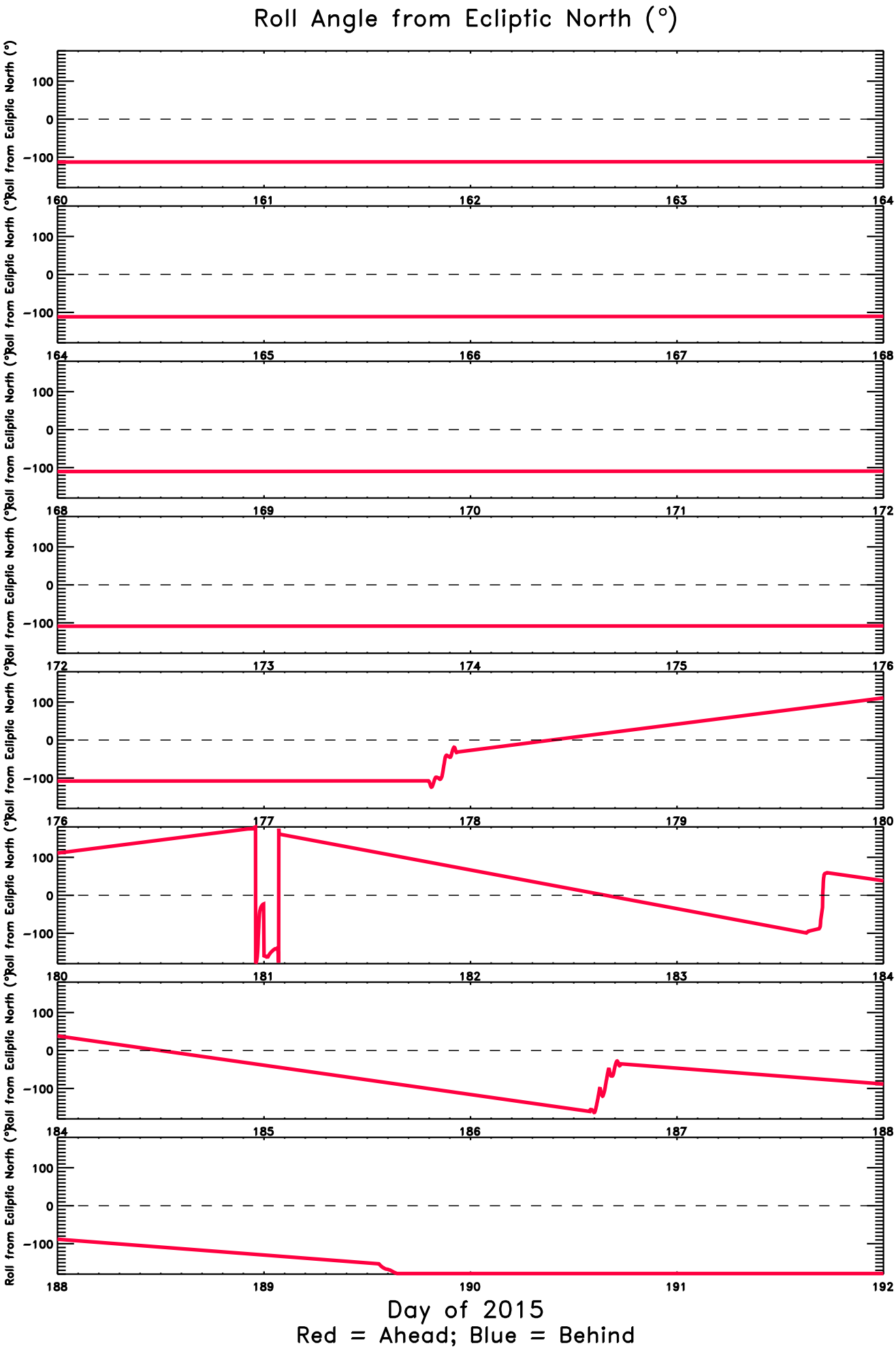
Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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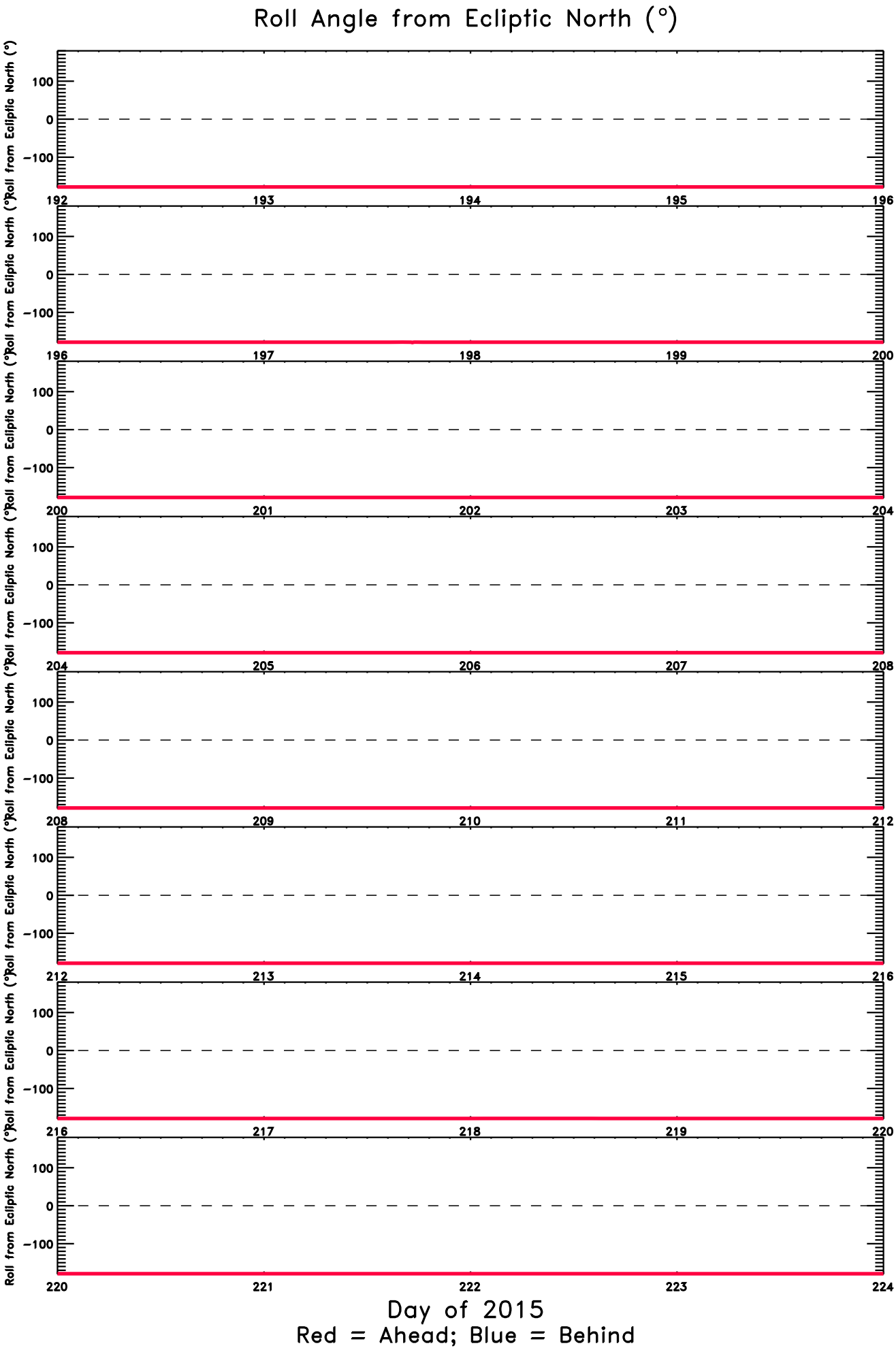
Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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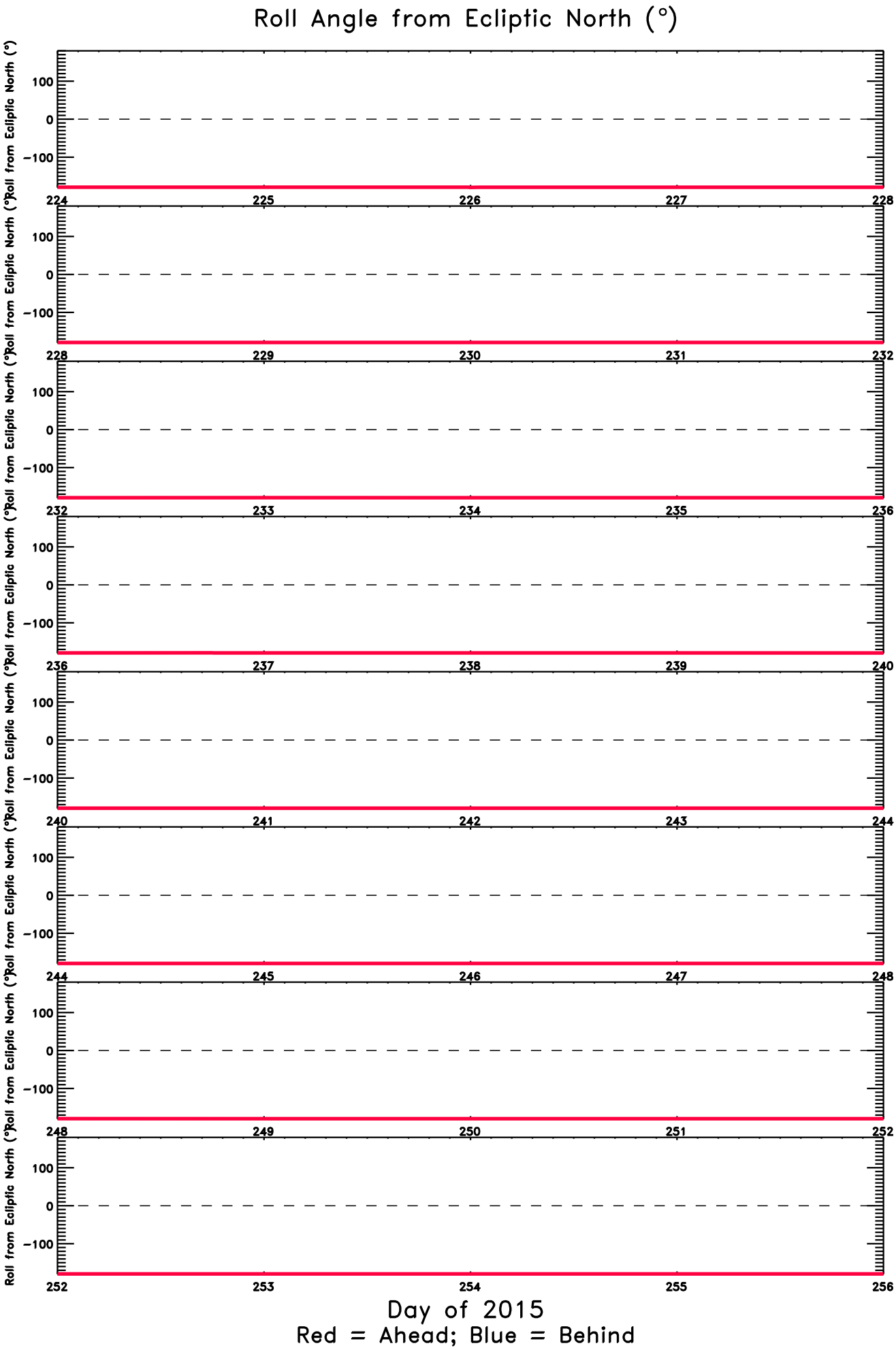
Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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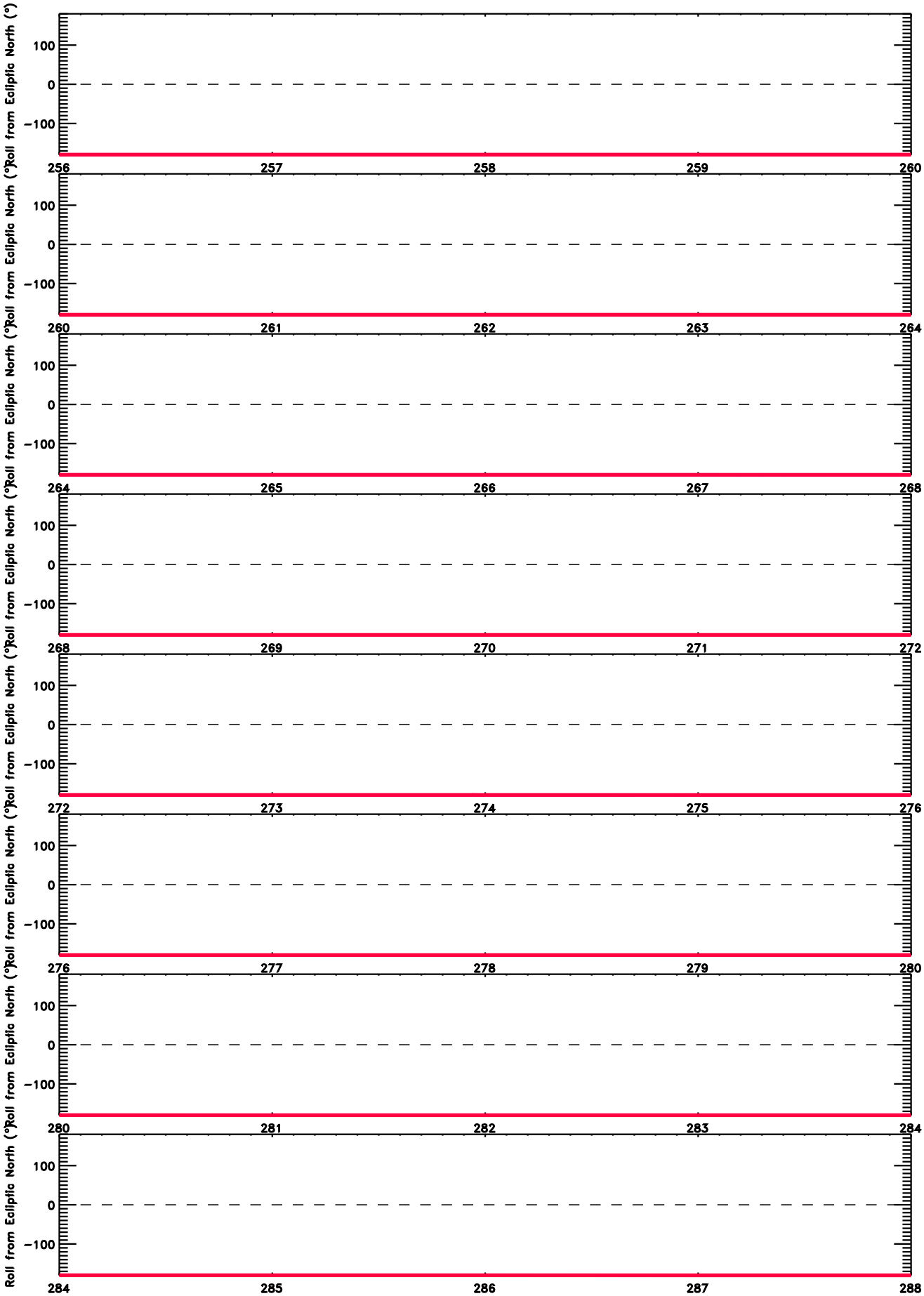
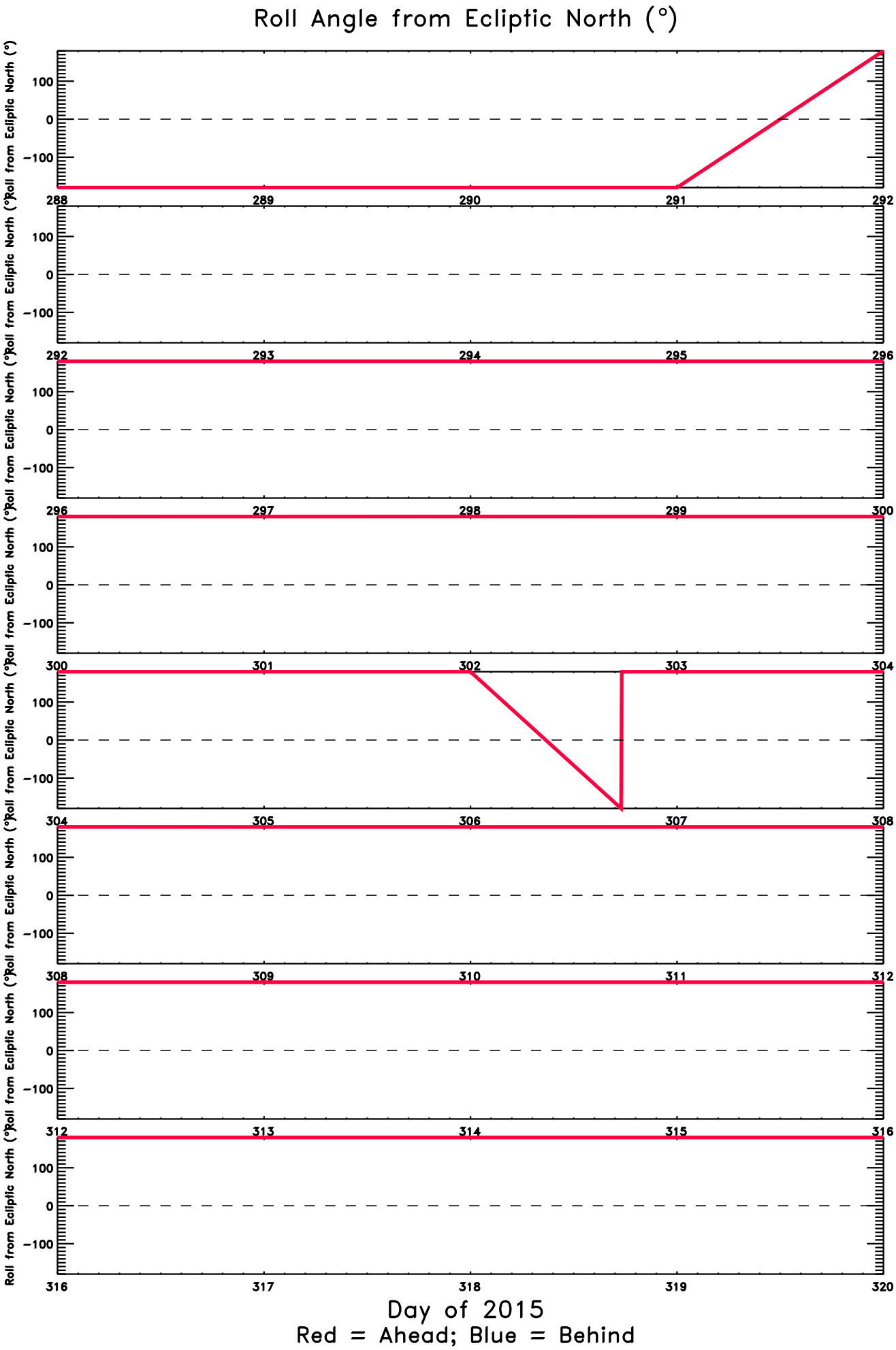
Day of 2015
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2015

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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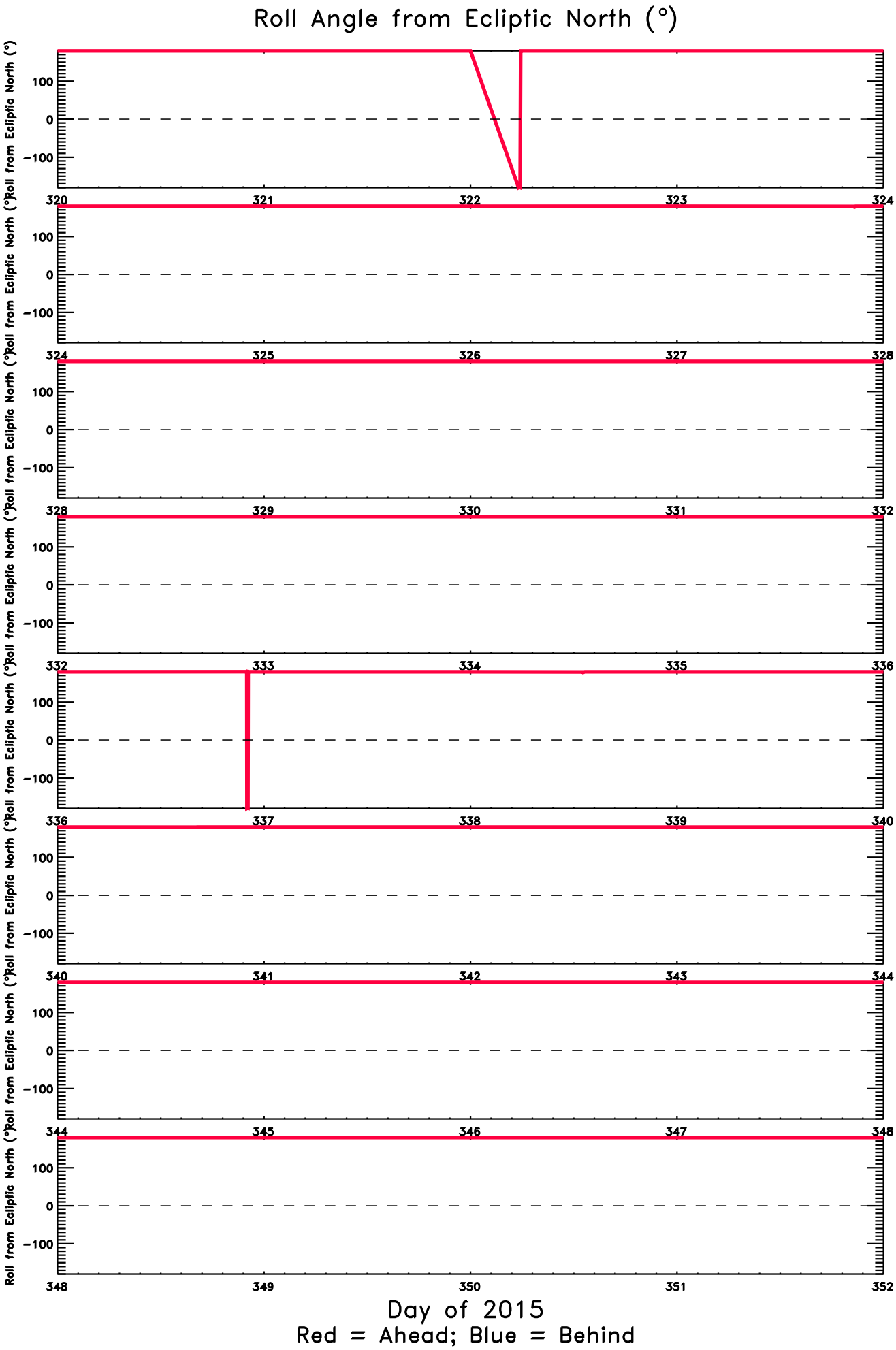
Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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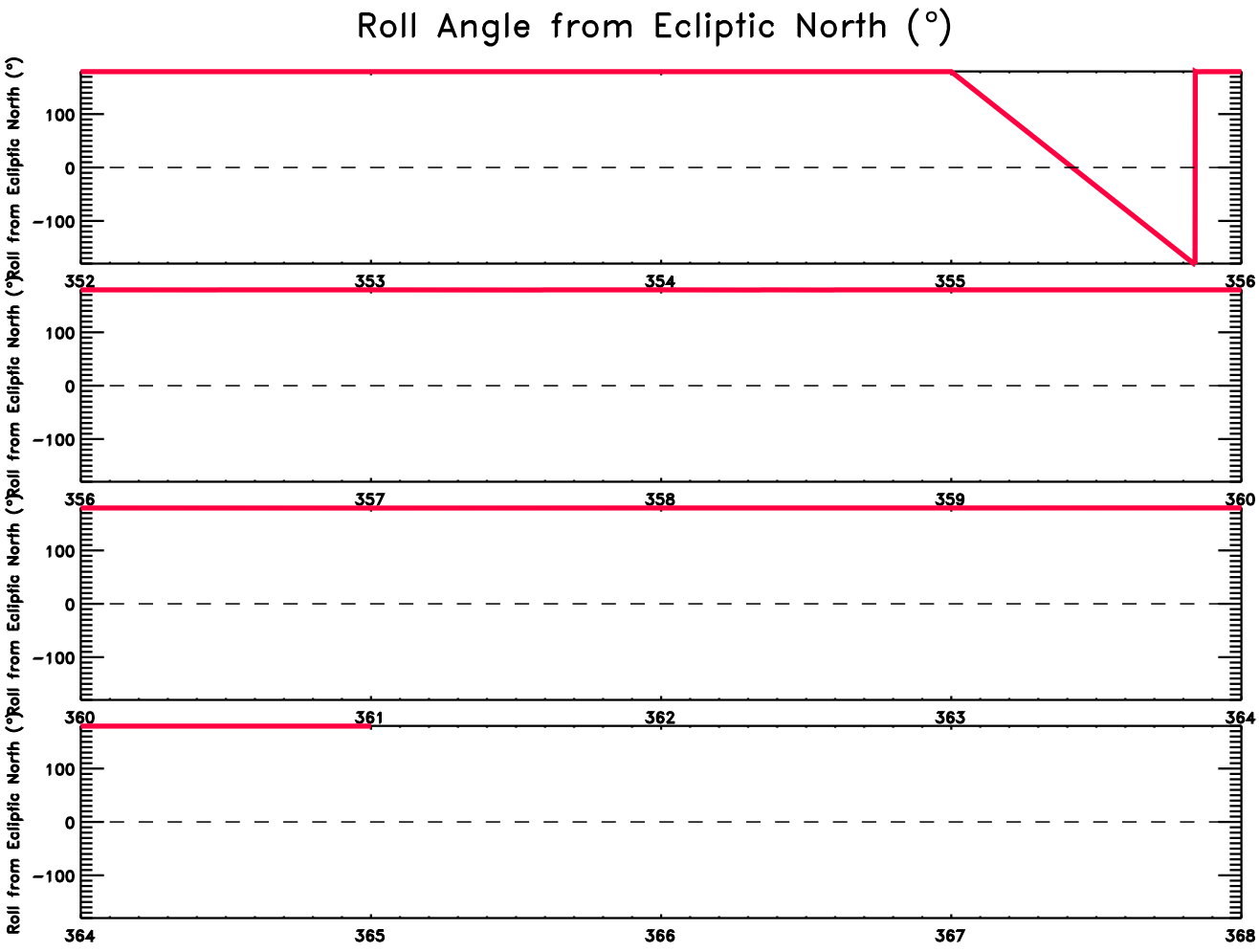
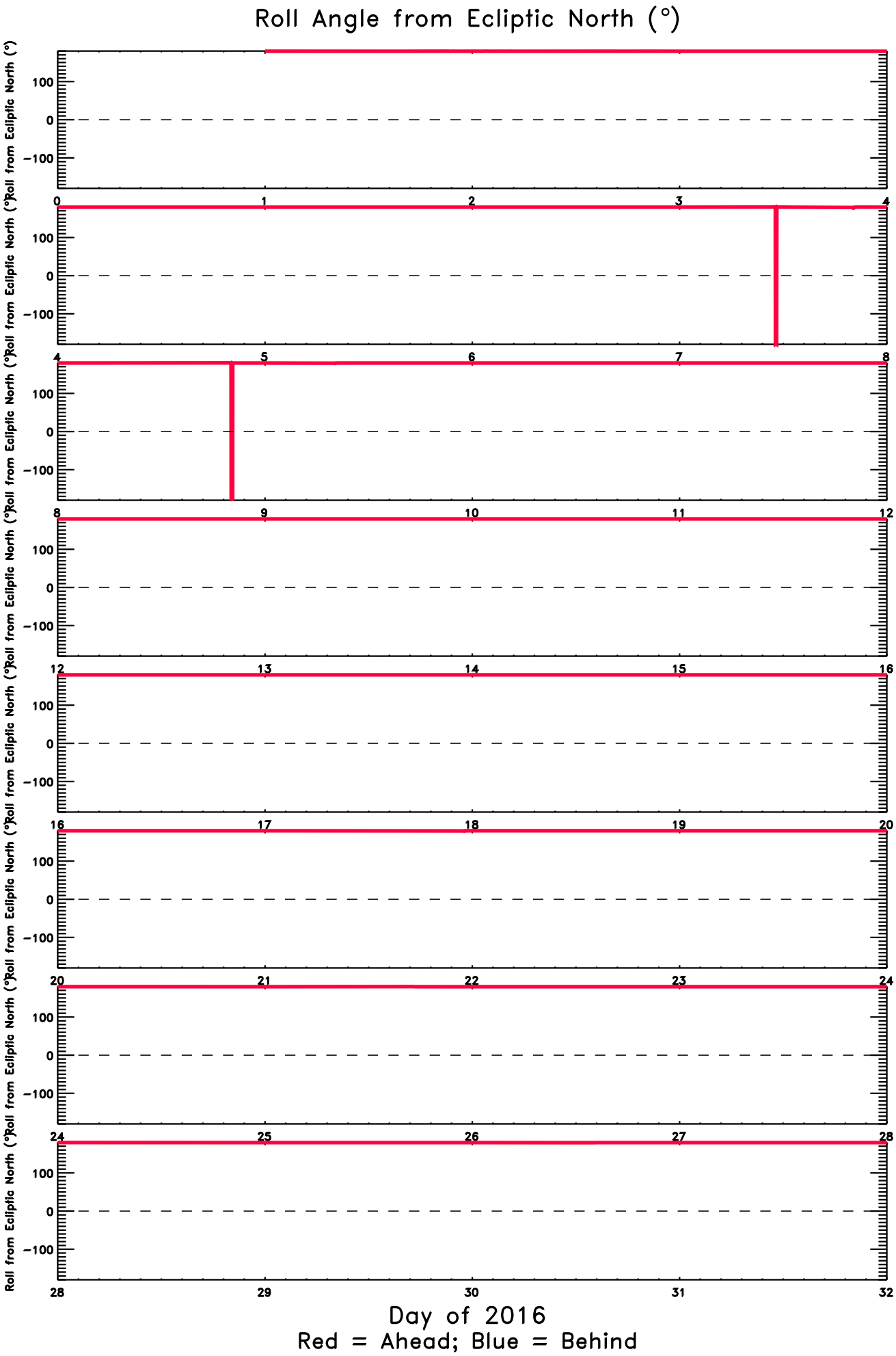
Day of 2015
Red = Ahead; Blue = Behind



Day of 2015
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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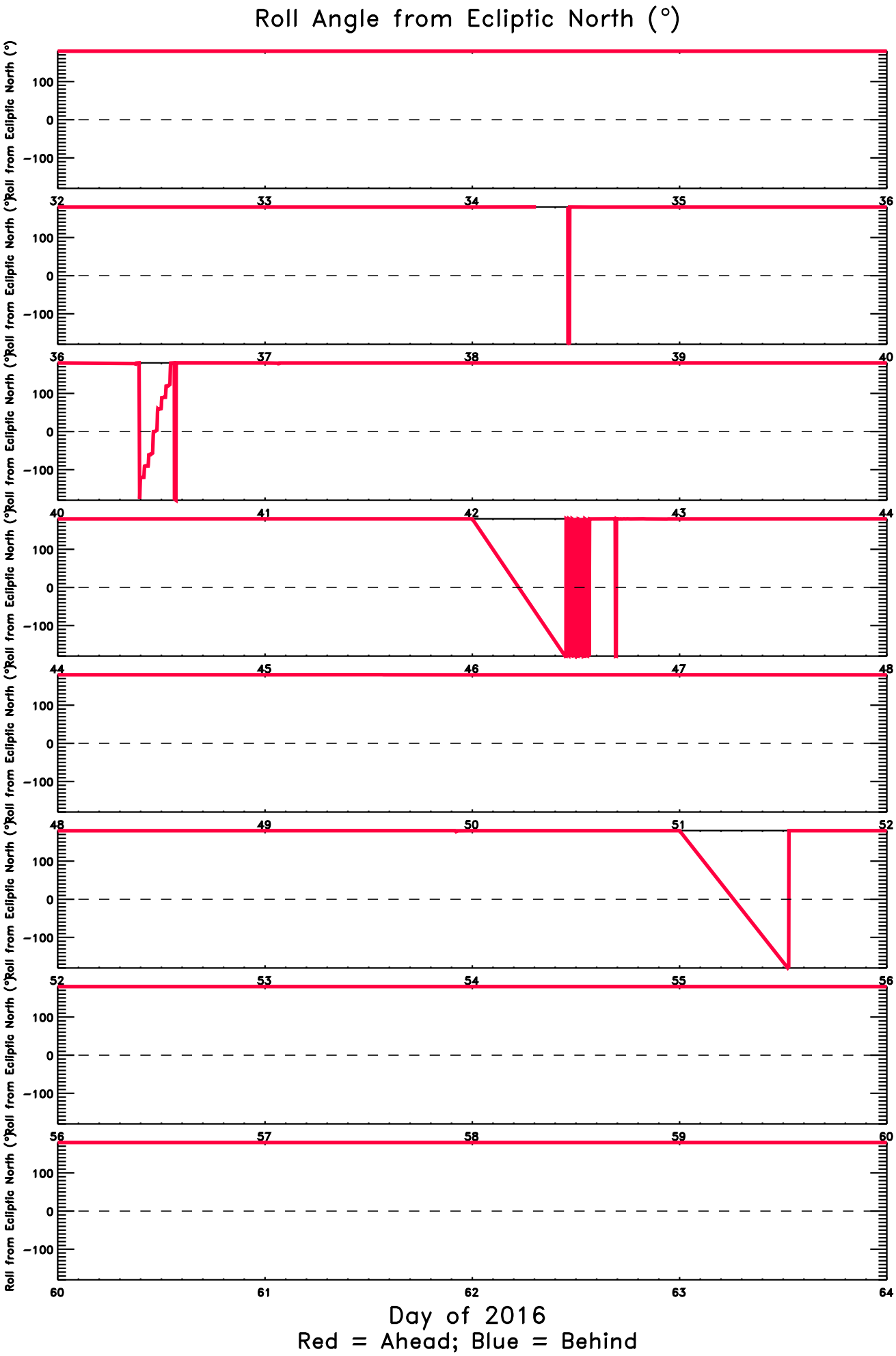
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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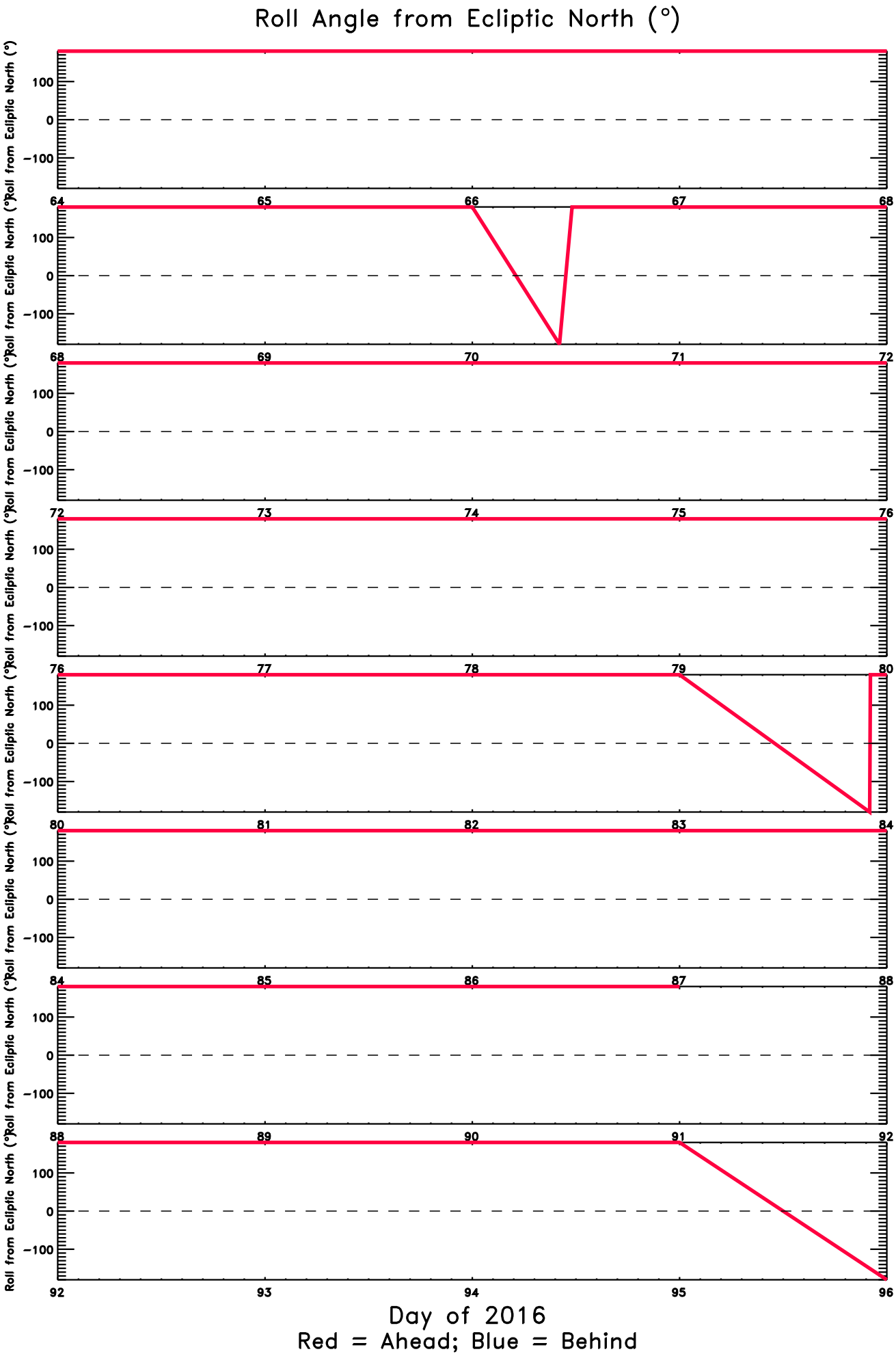
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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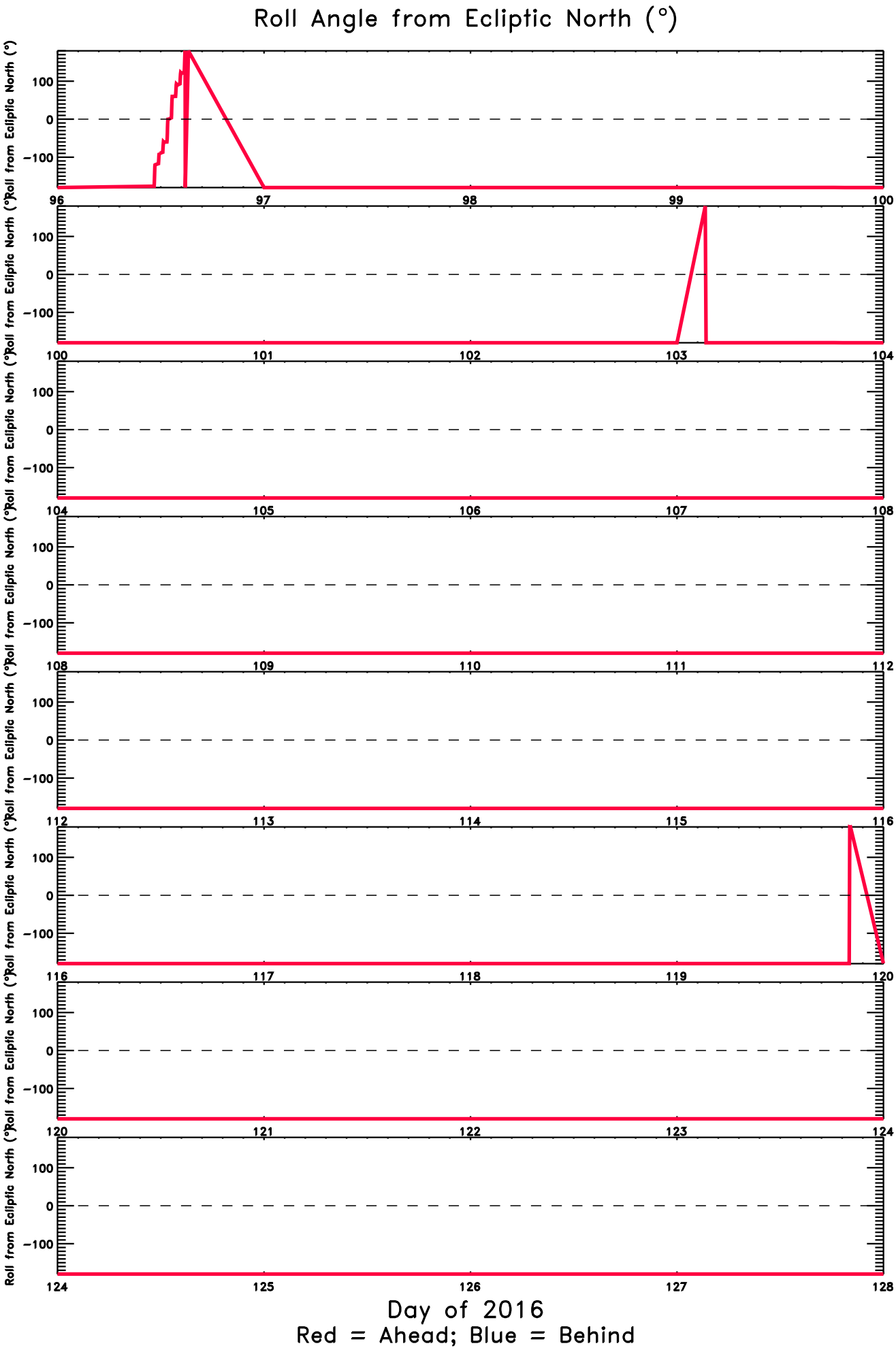
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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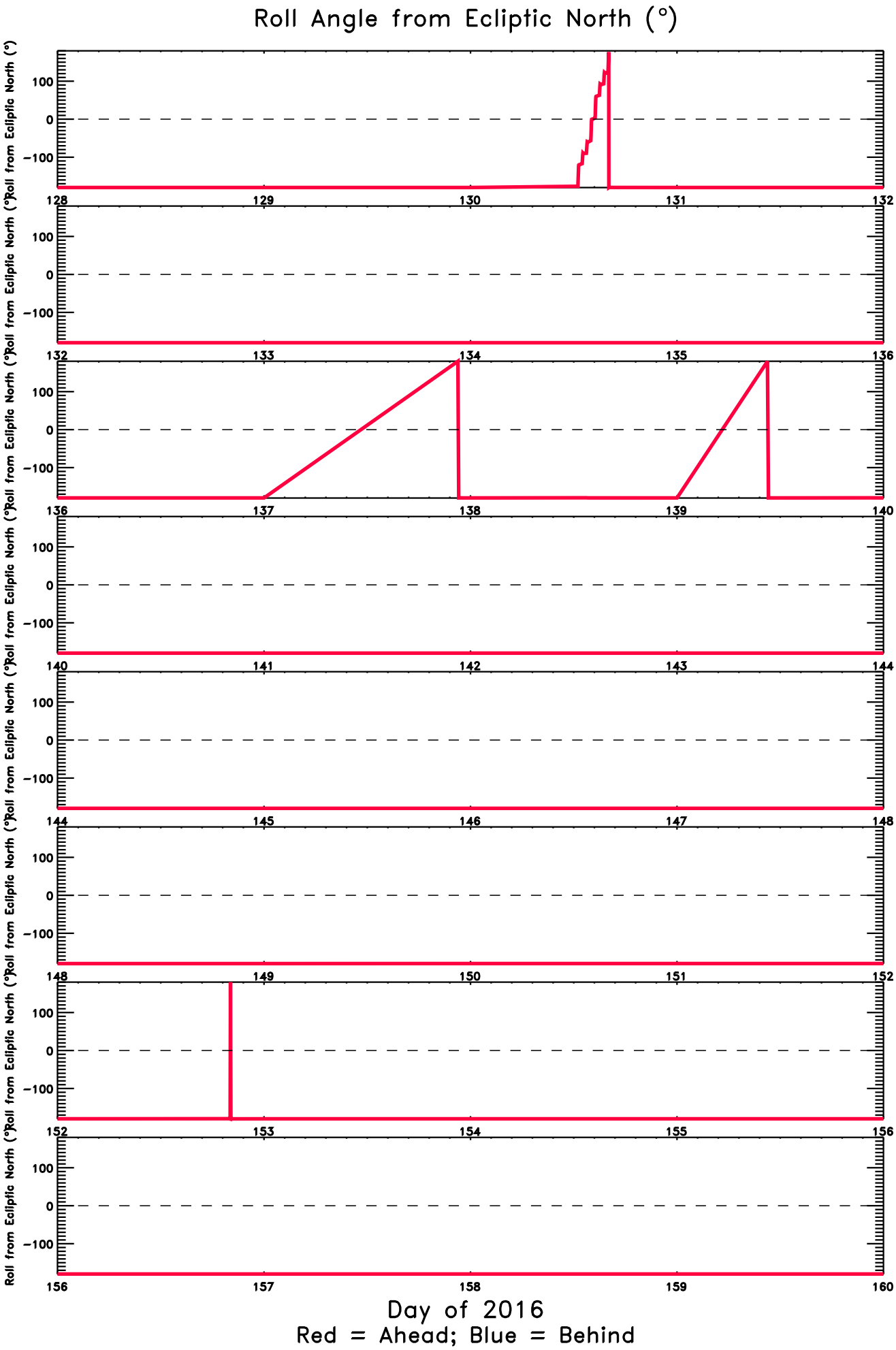
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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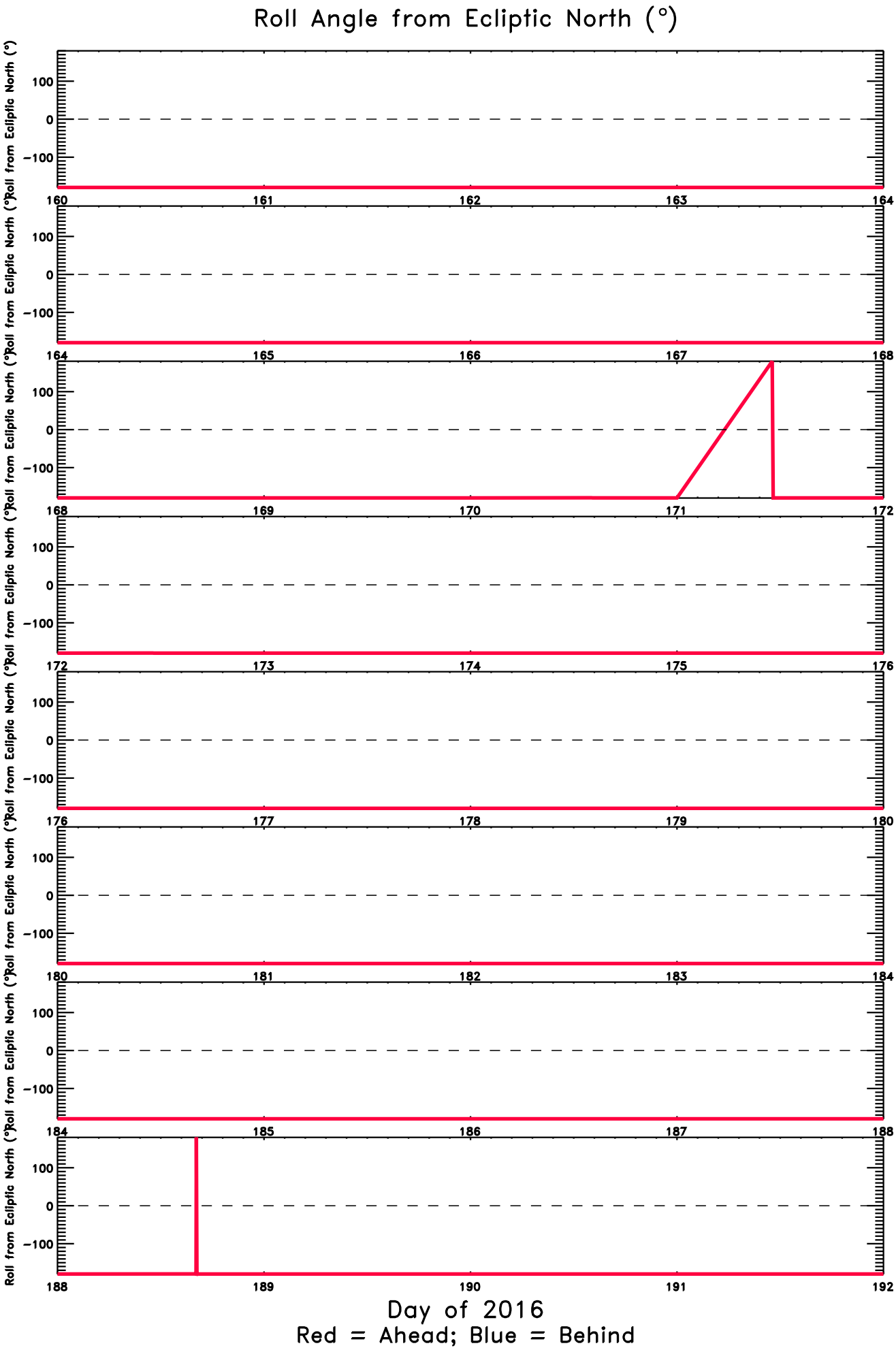
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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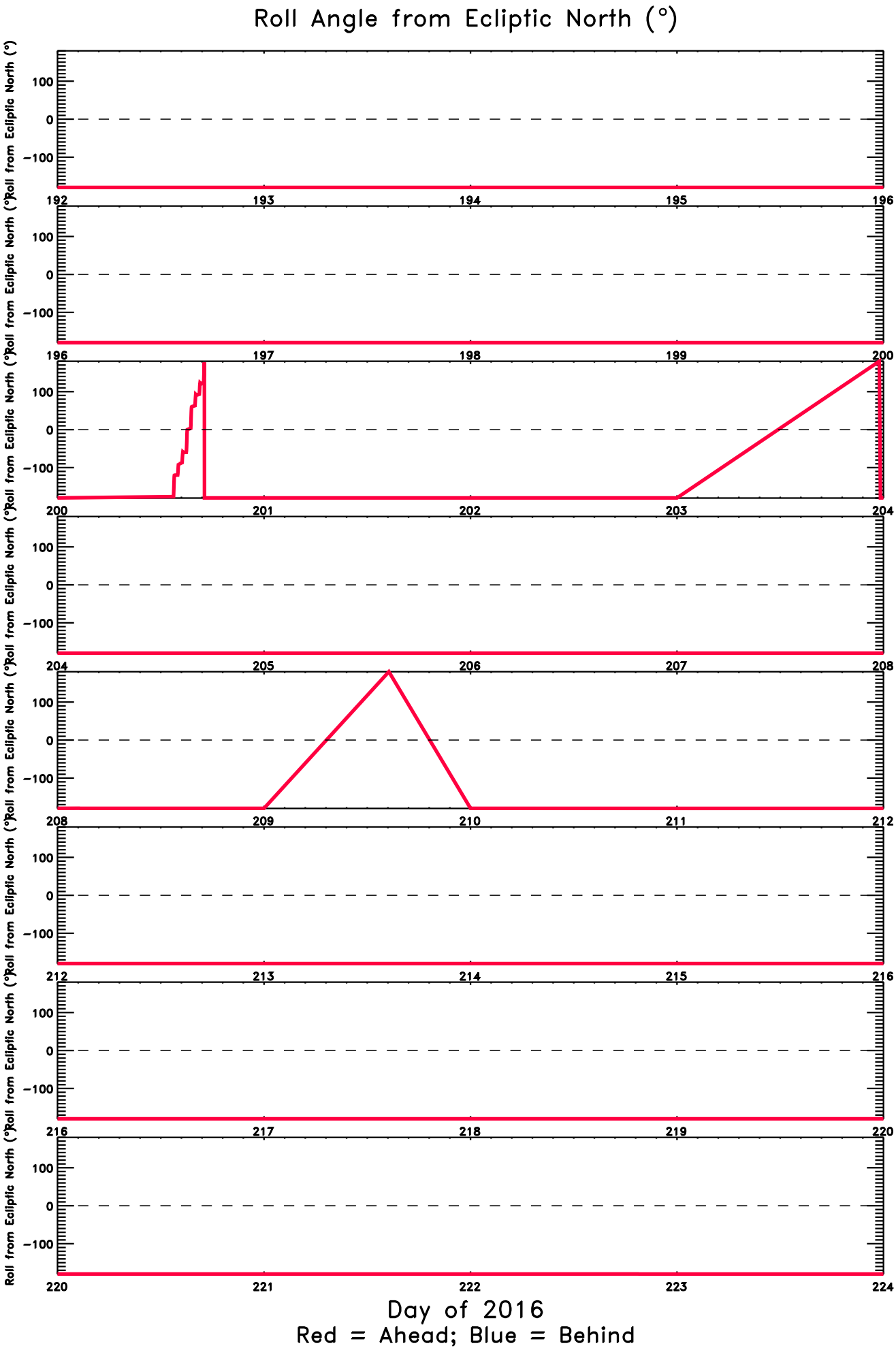
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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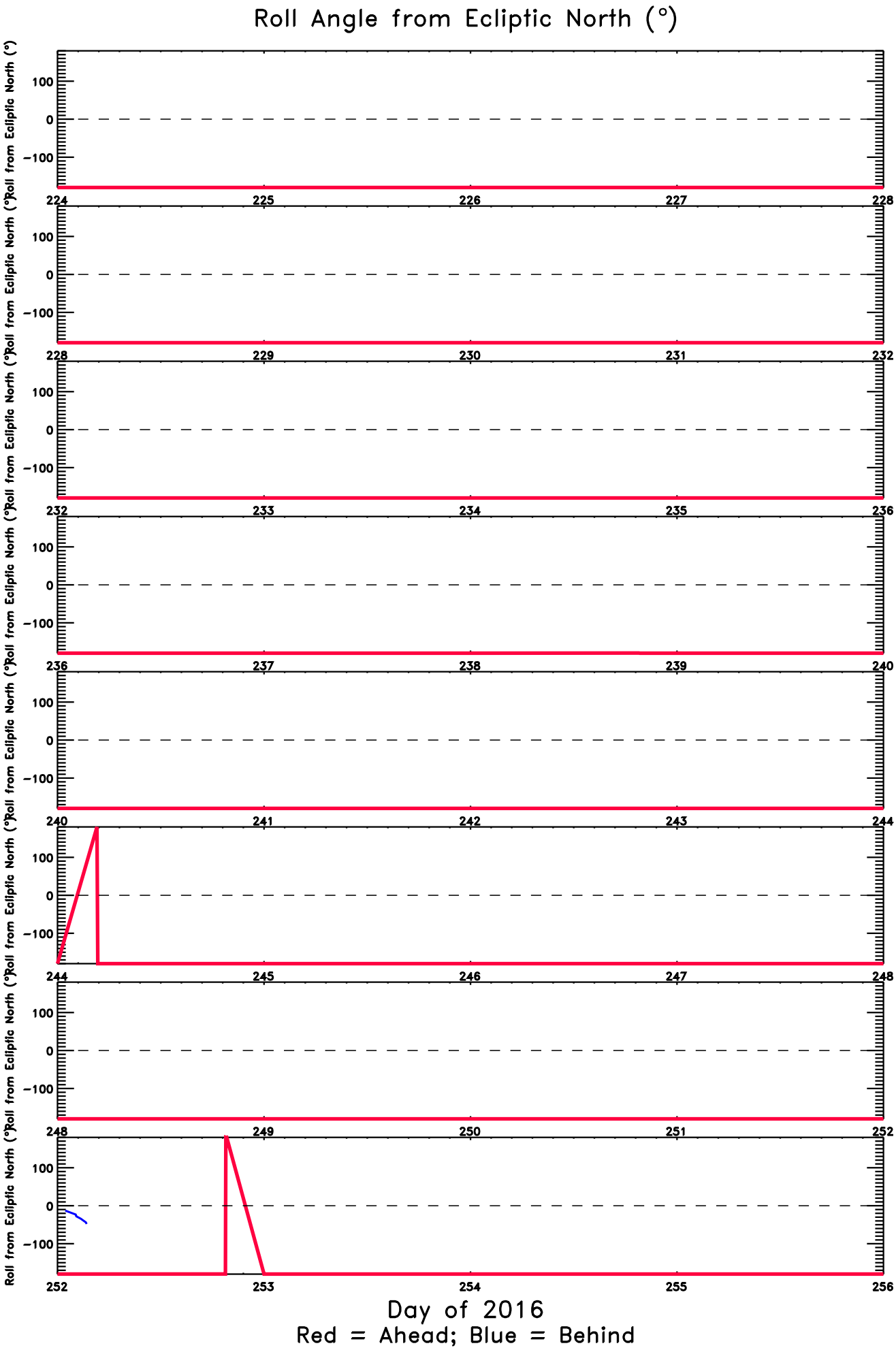
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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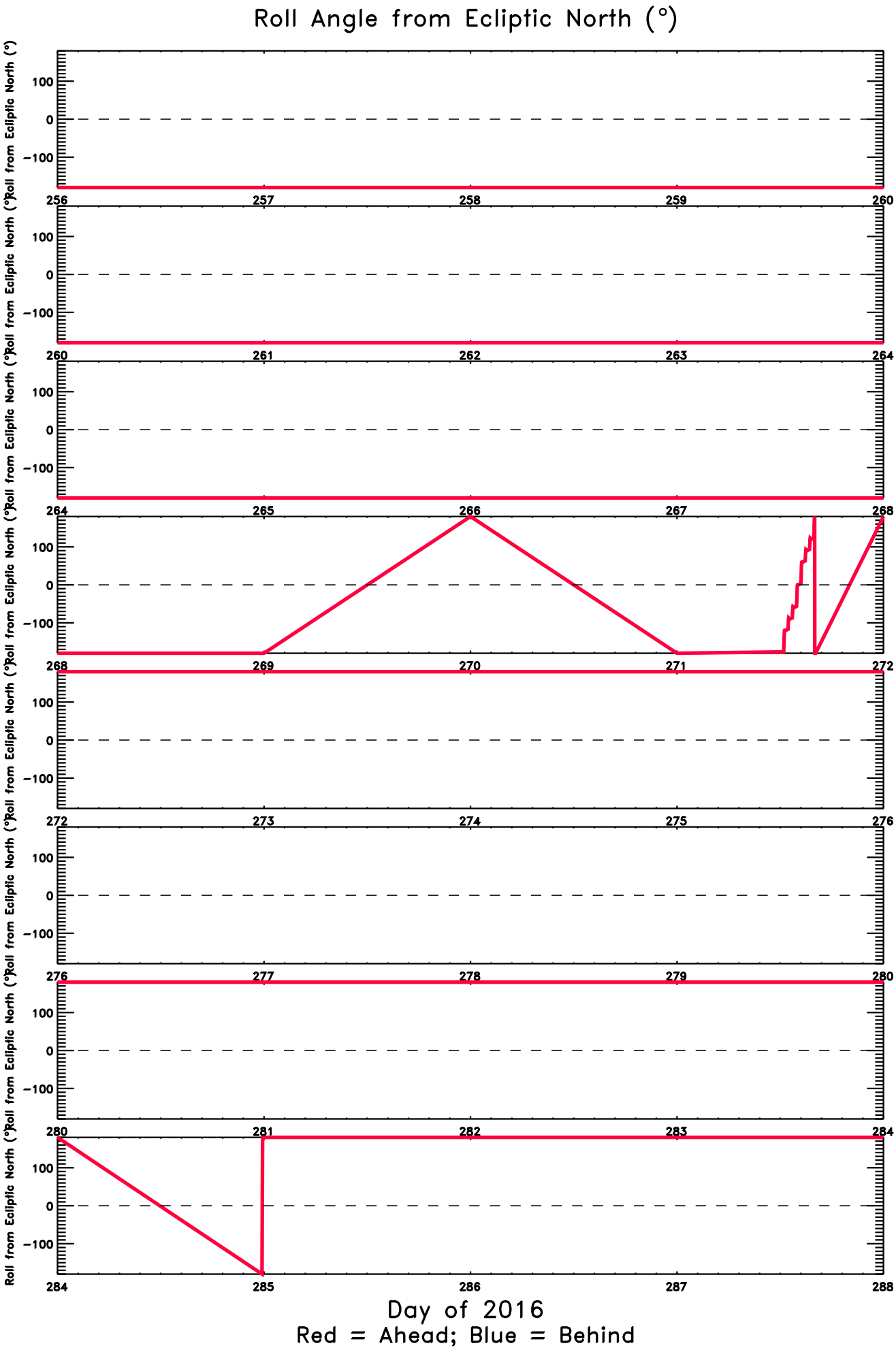
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
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256
257
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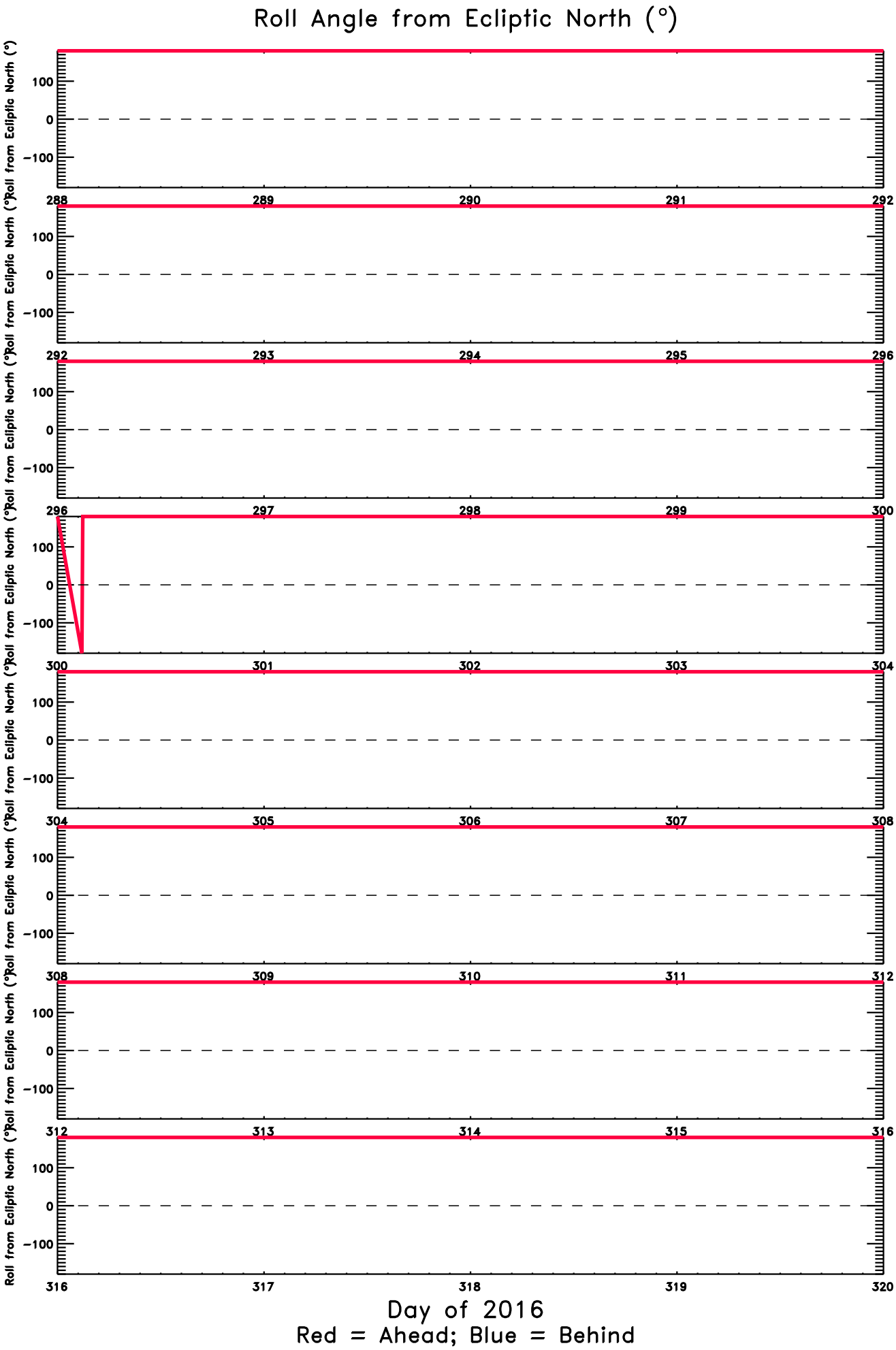
286
287
288
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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318
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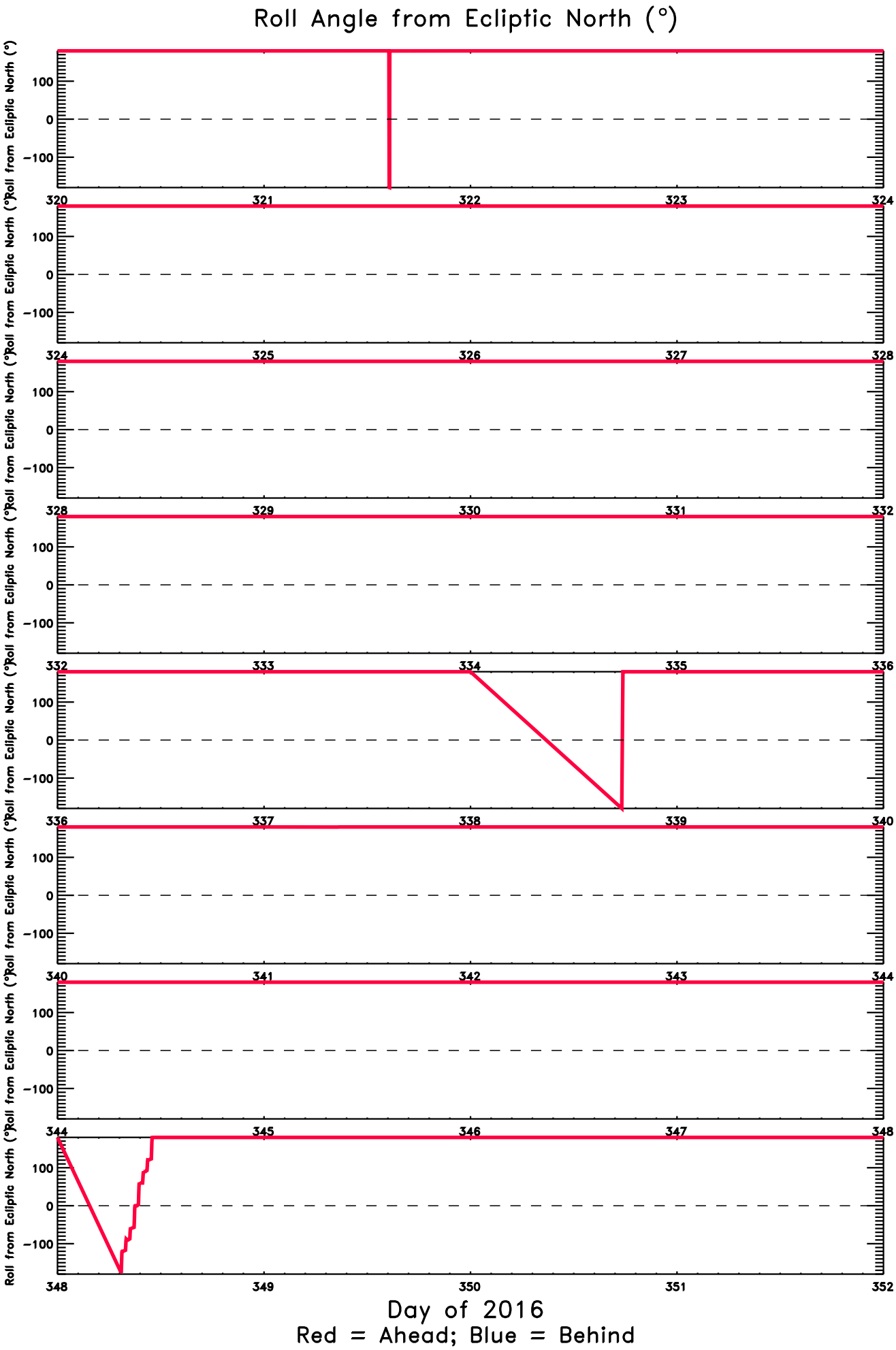
Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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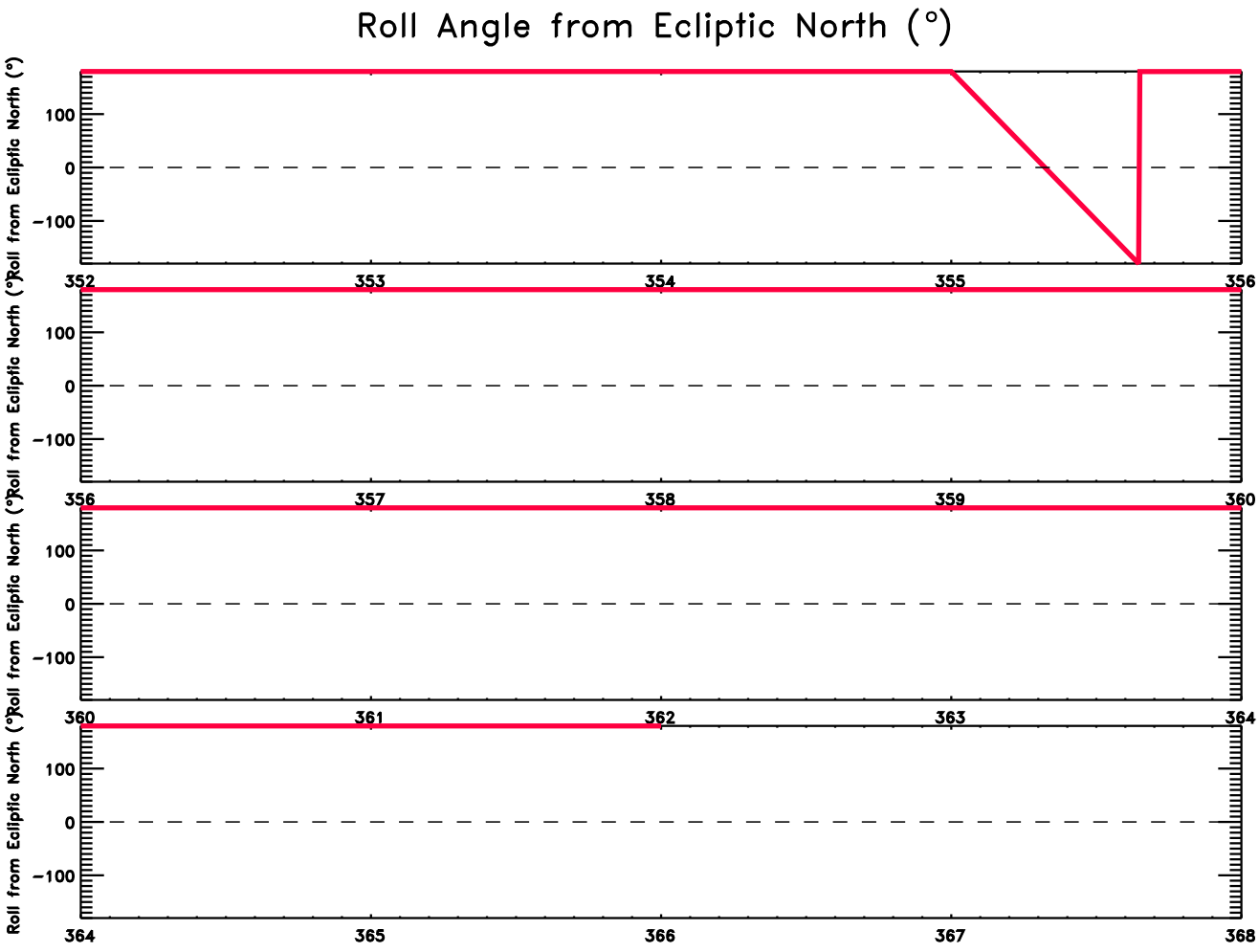
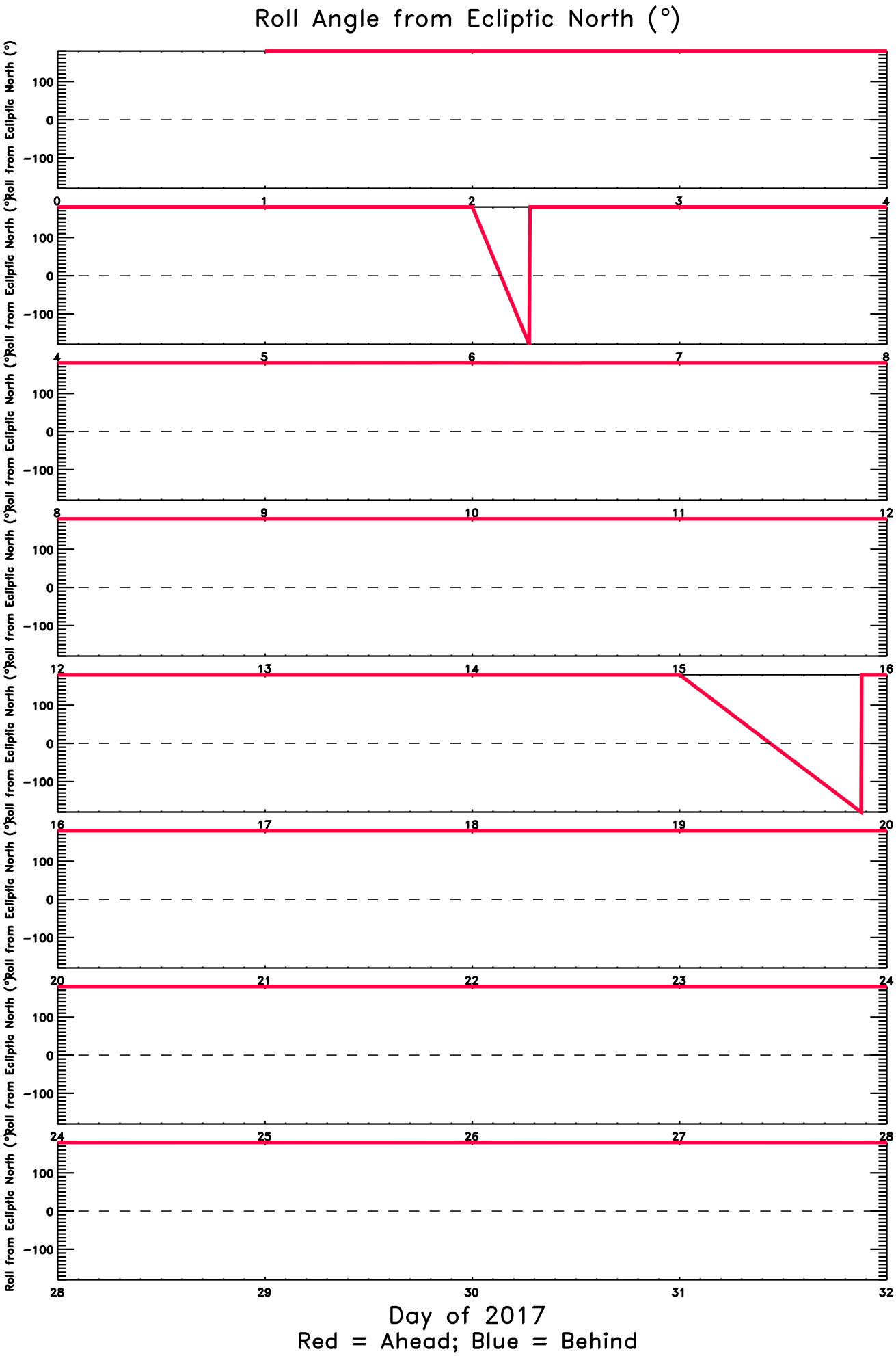
Day of 2016
Red = Ahead; Blue = Behind



Day of 2016
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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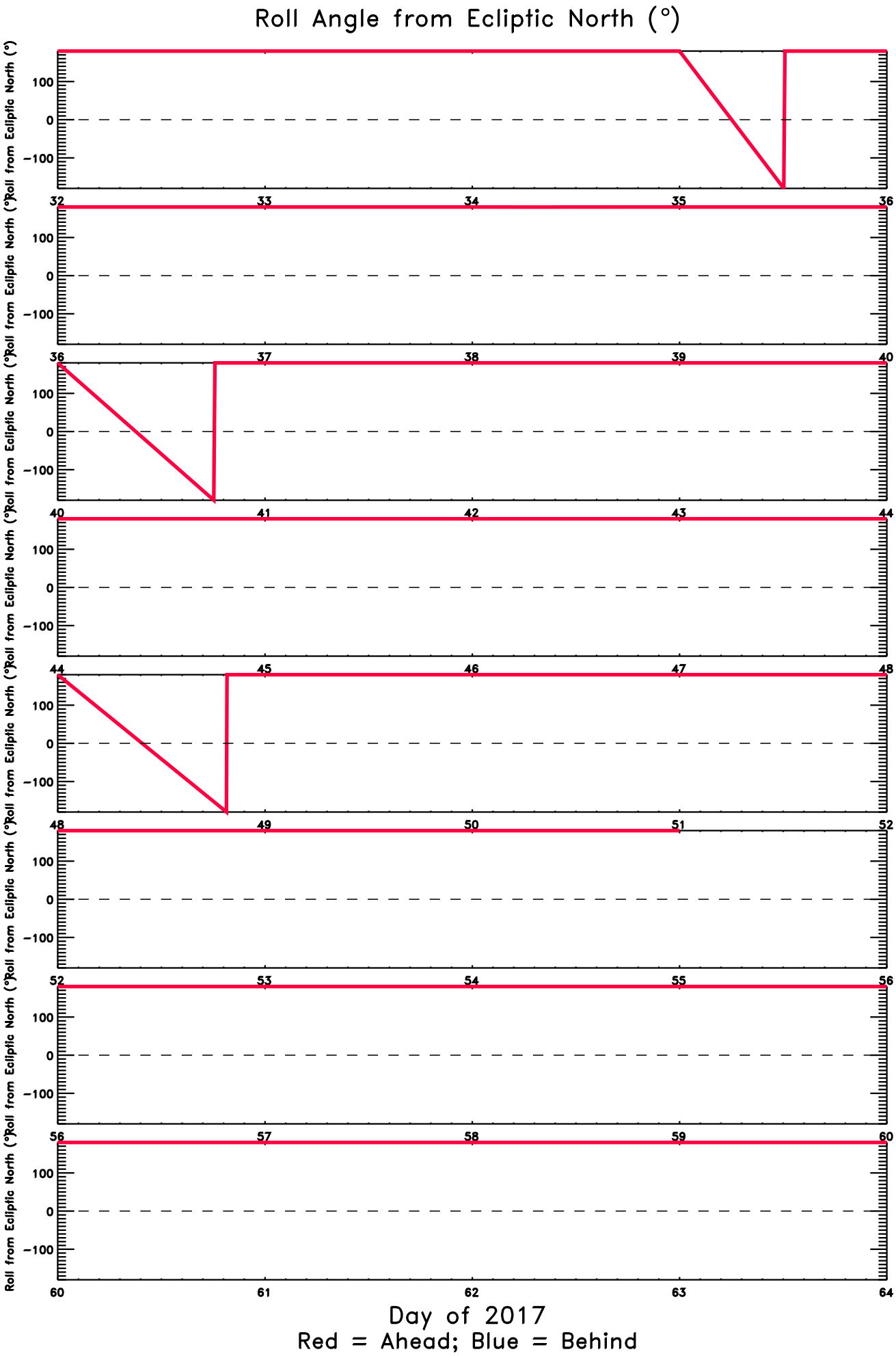
Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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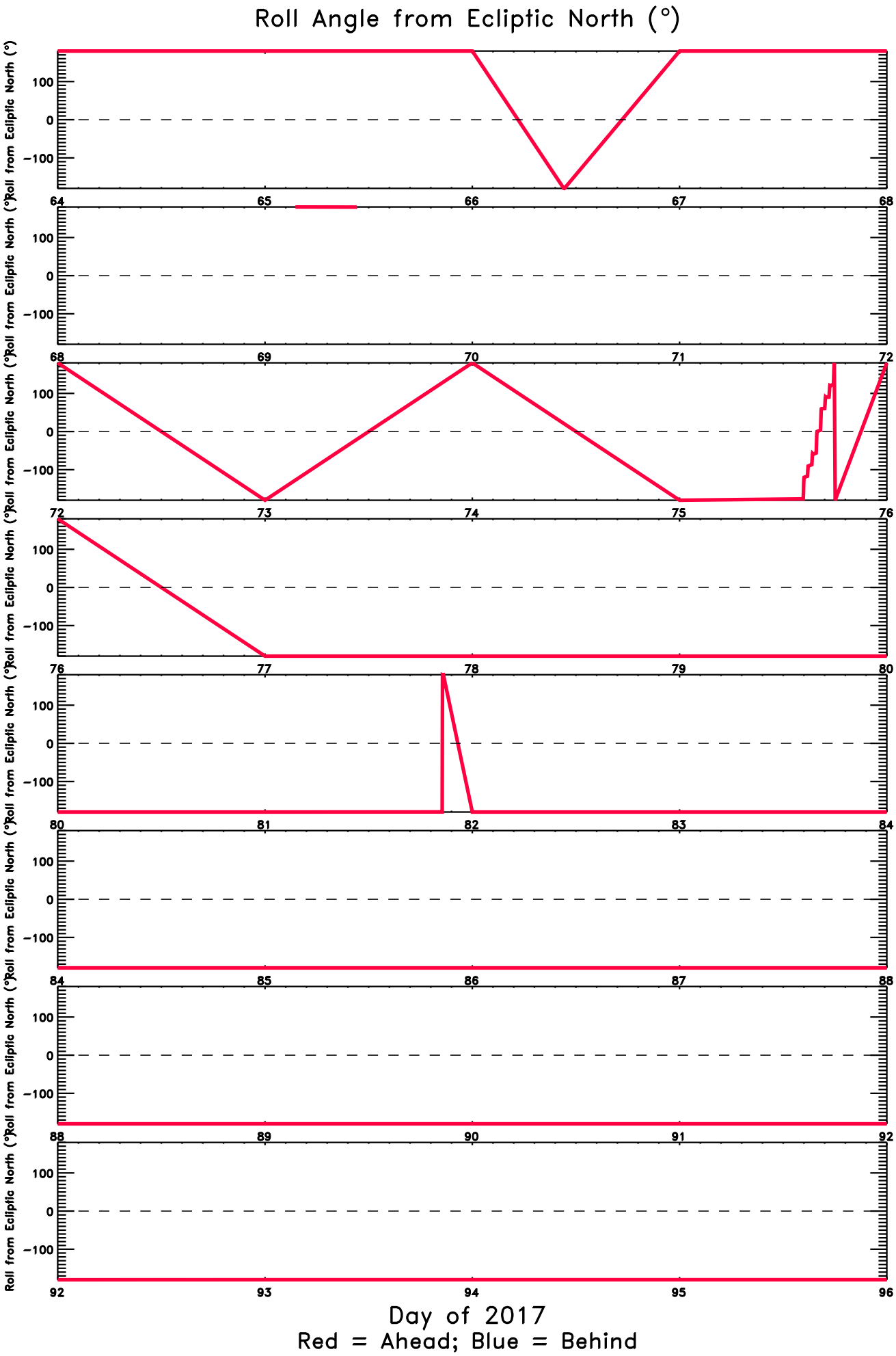
64
Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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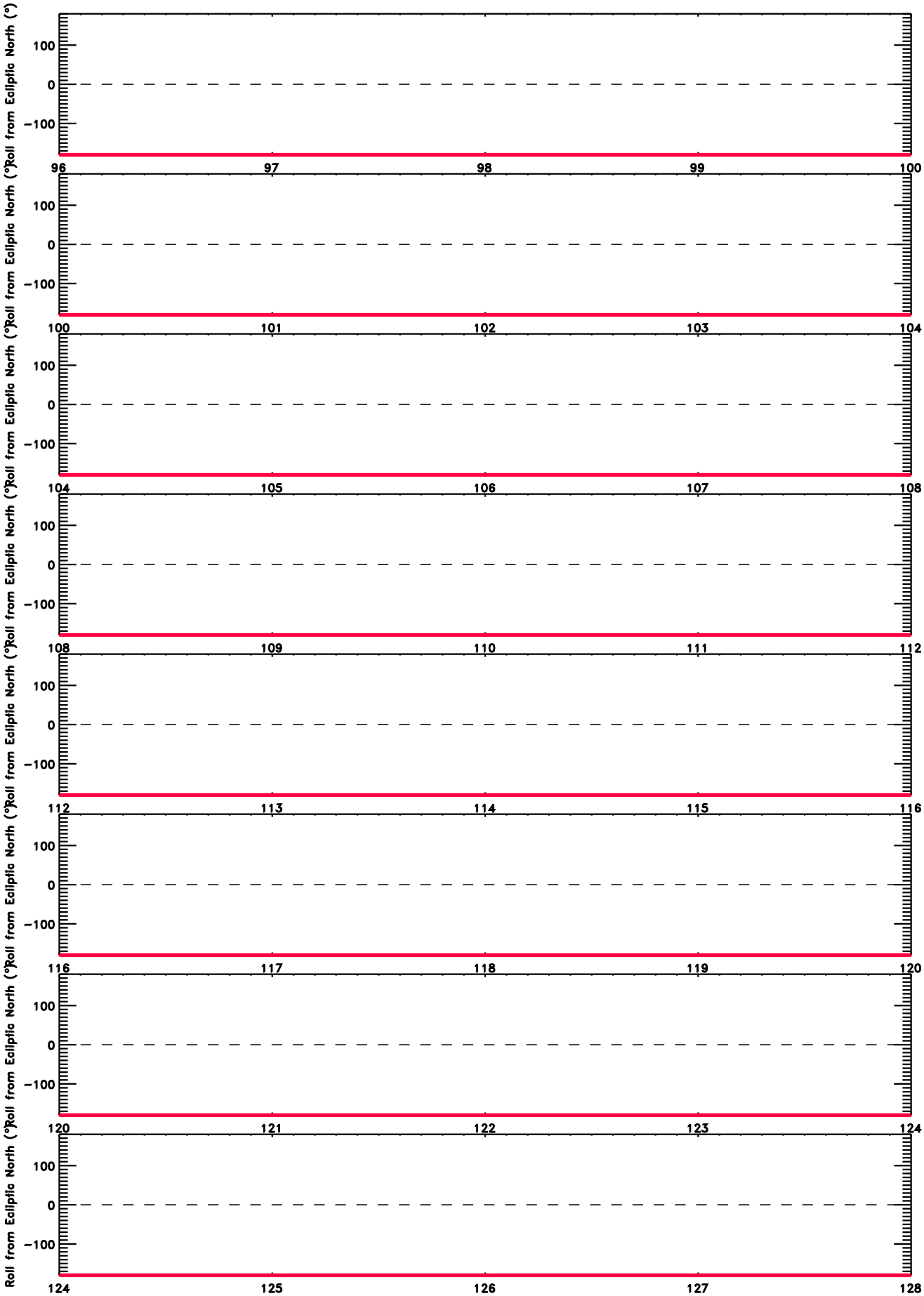
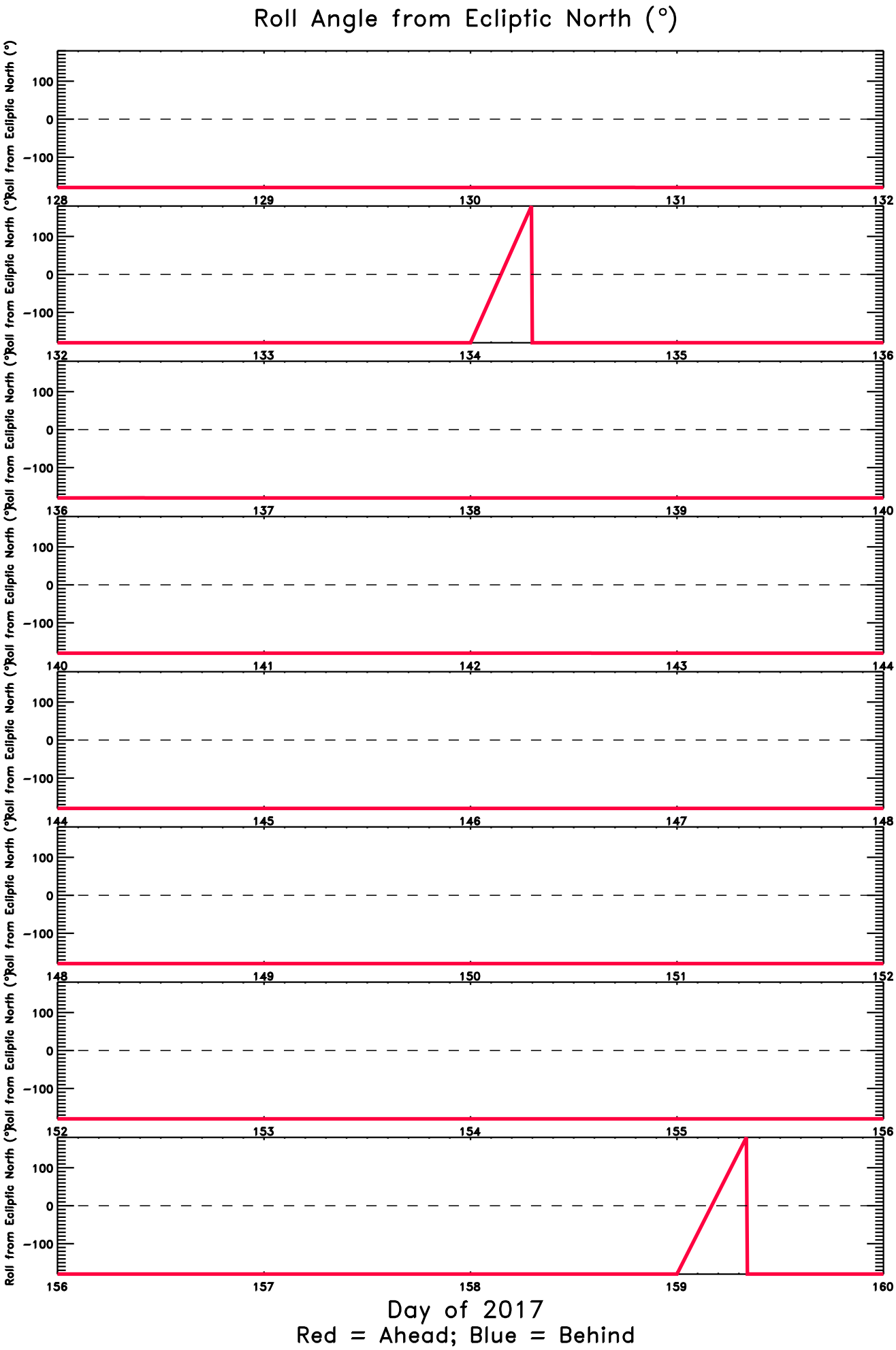
Day of 2017
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2017

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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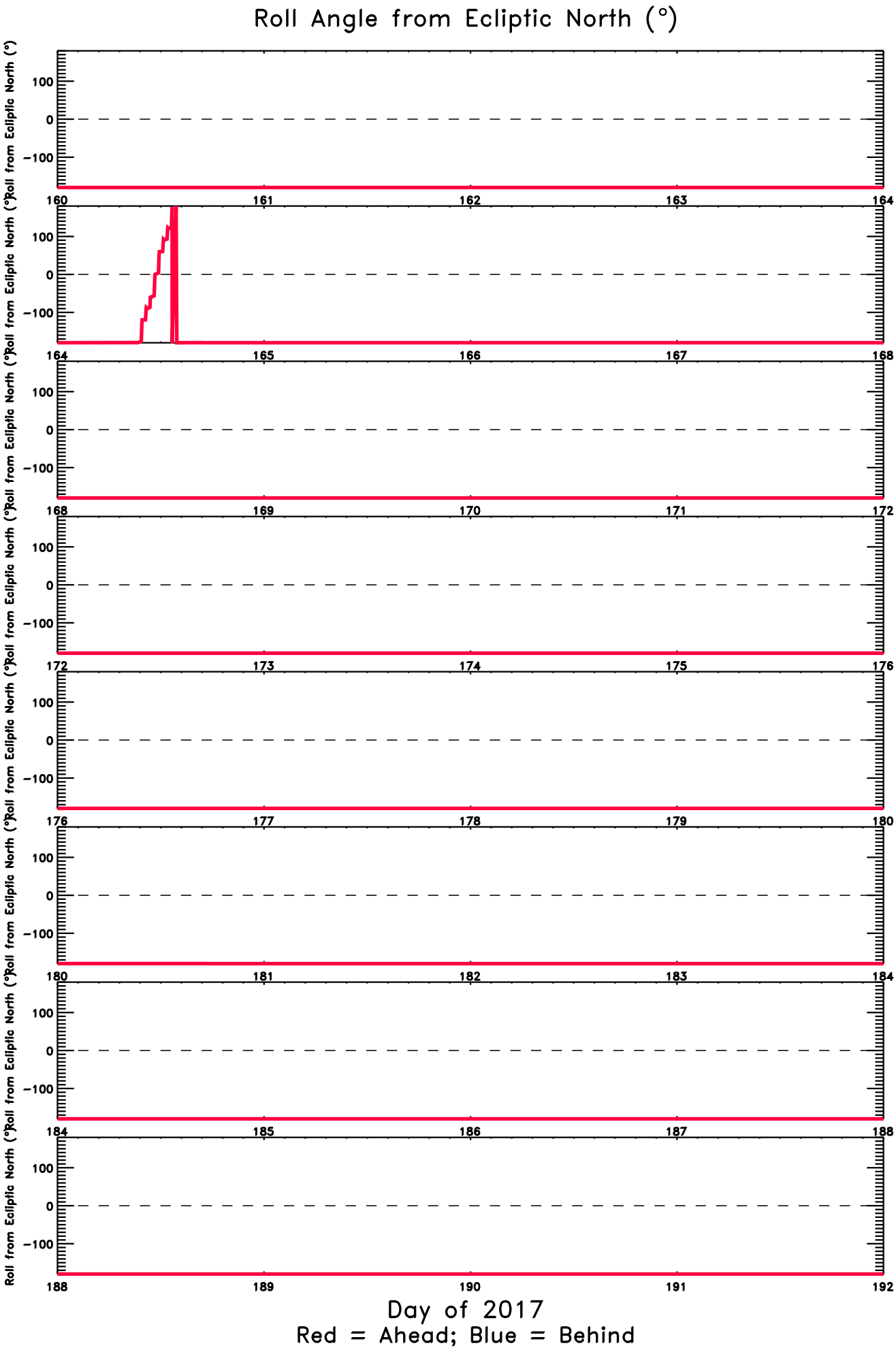
Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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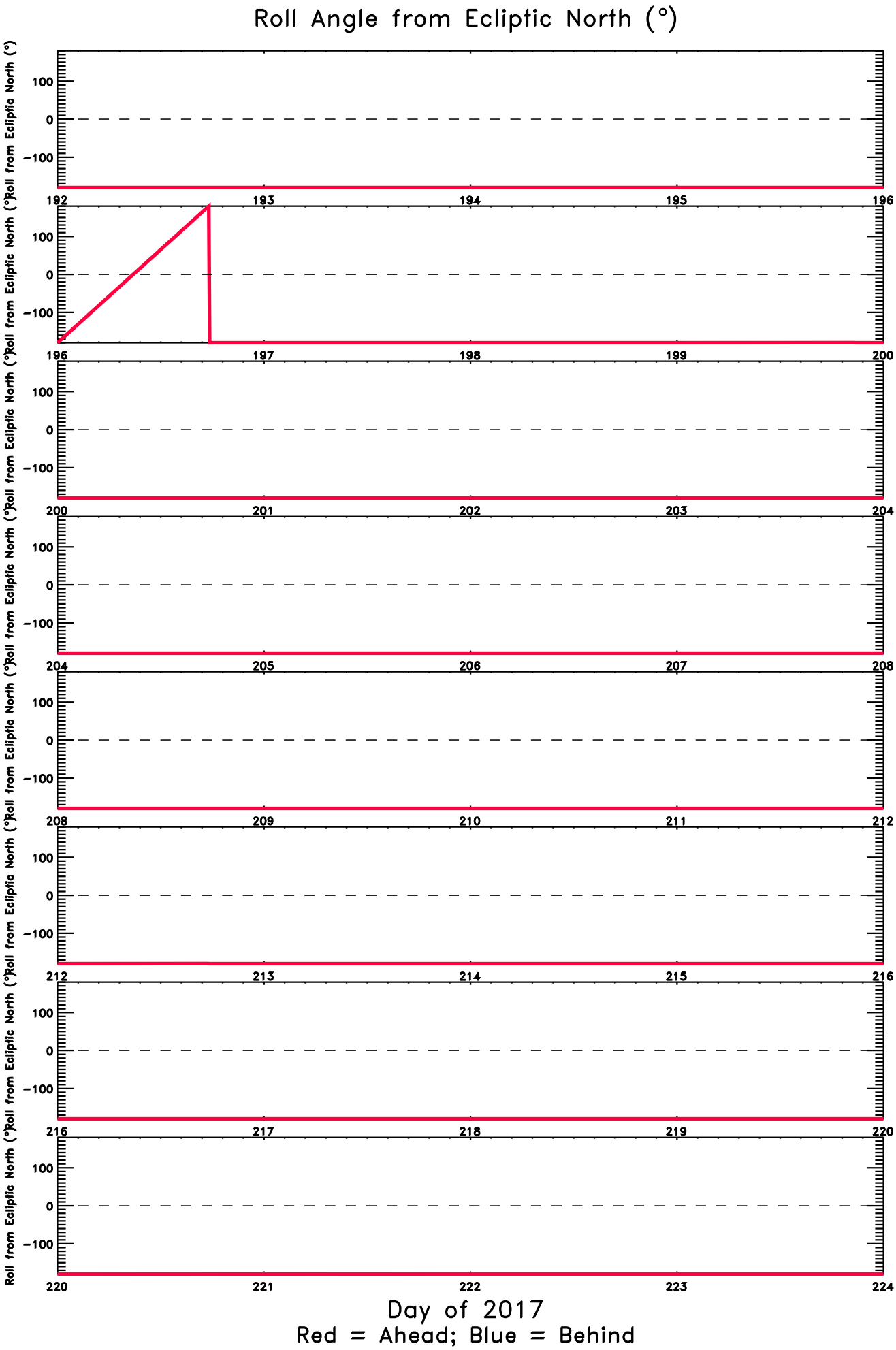
Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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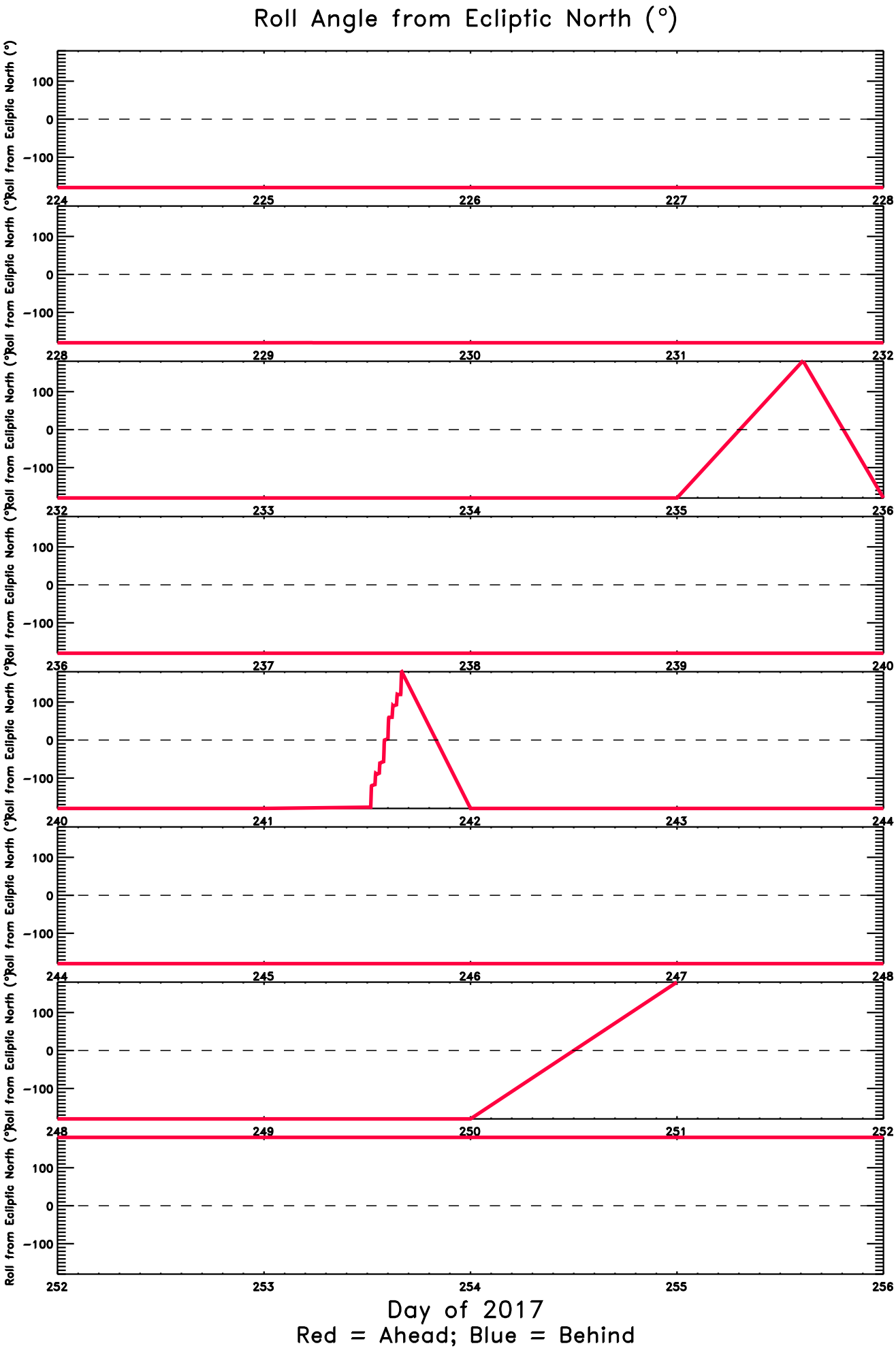
Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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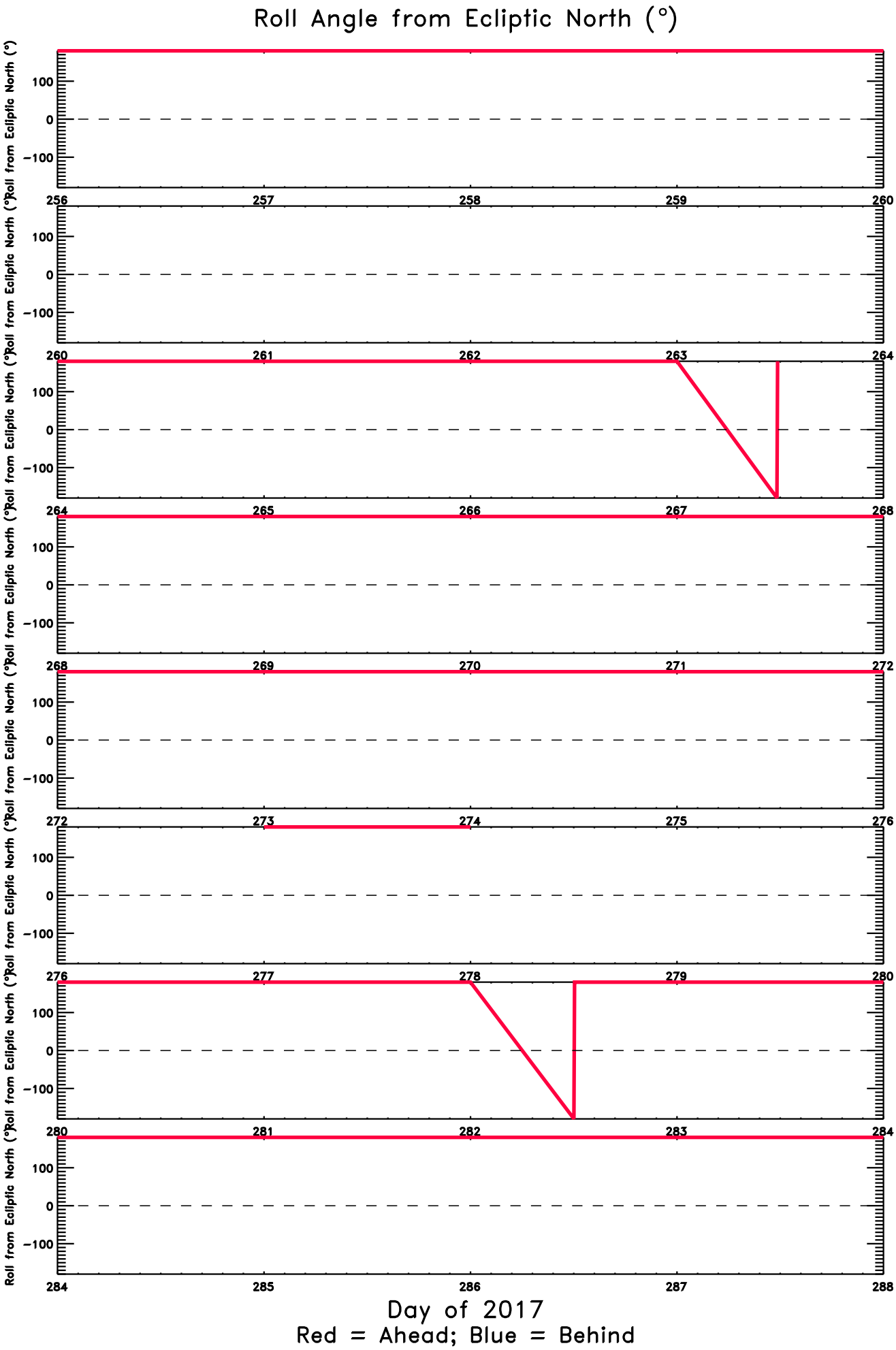
Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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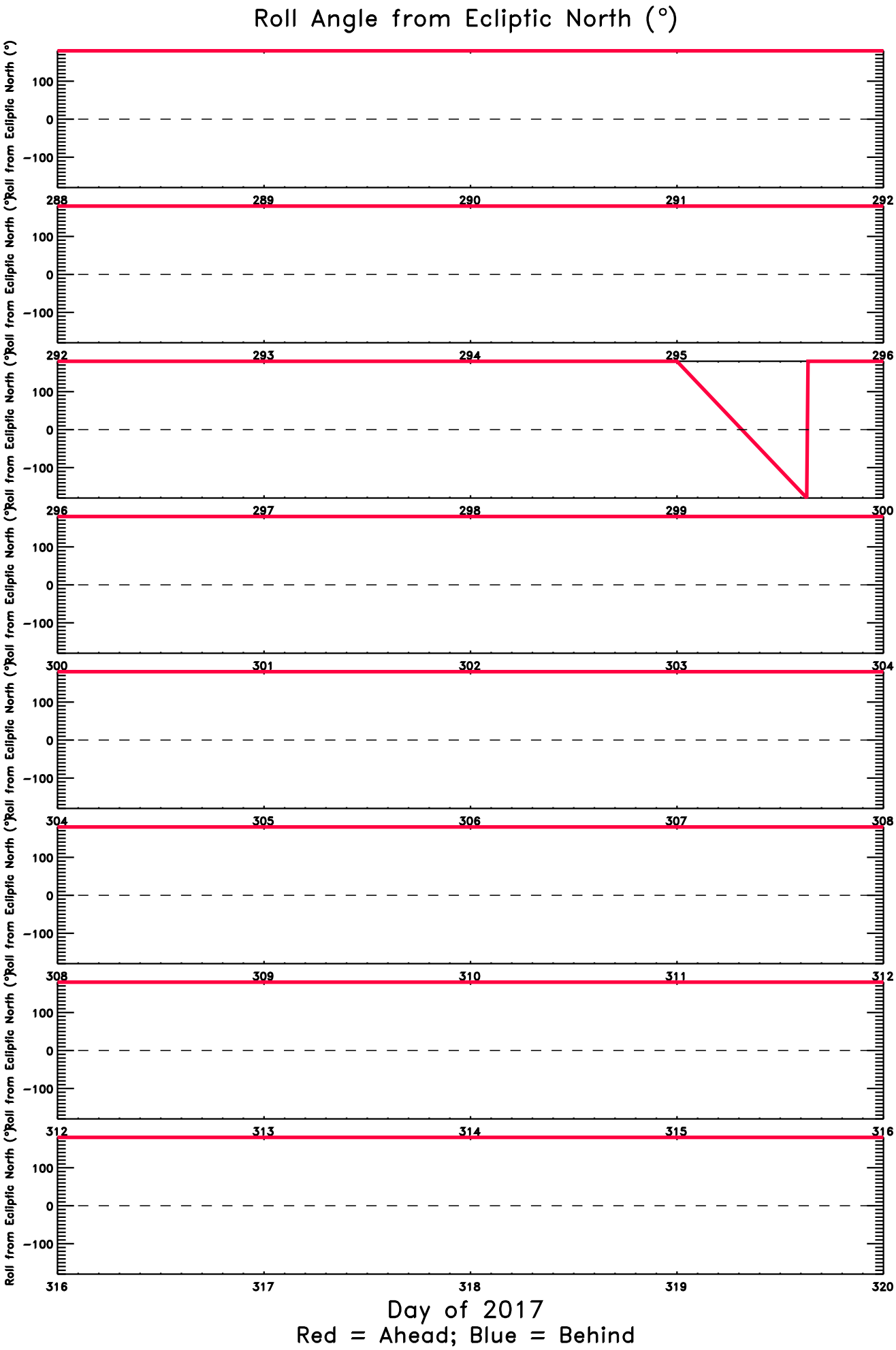
Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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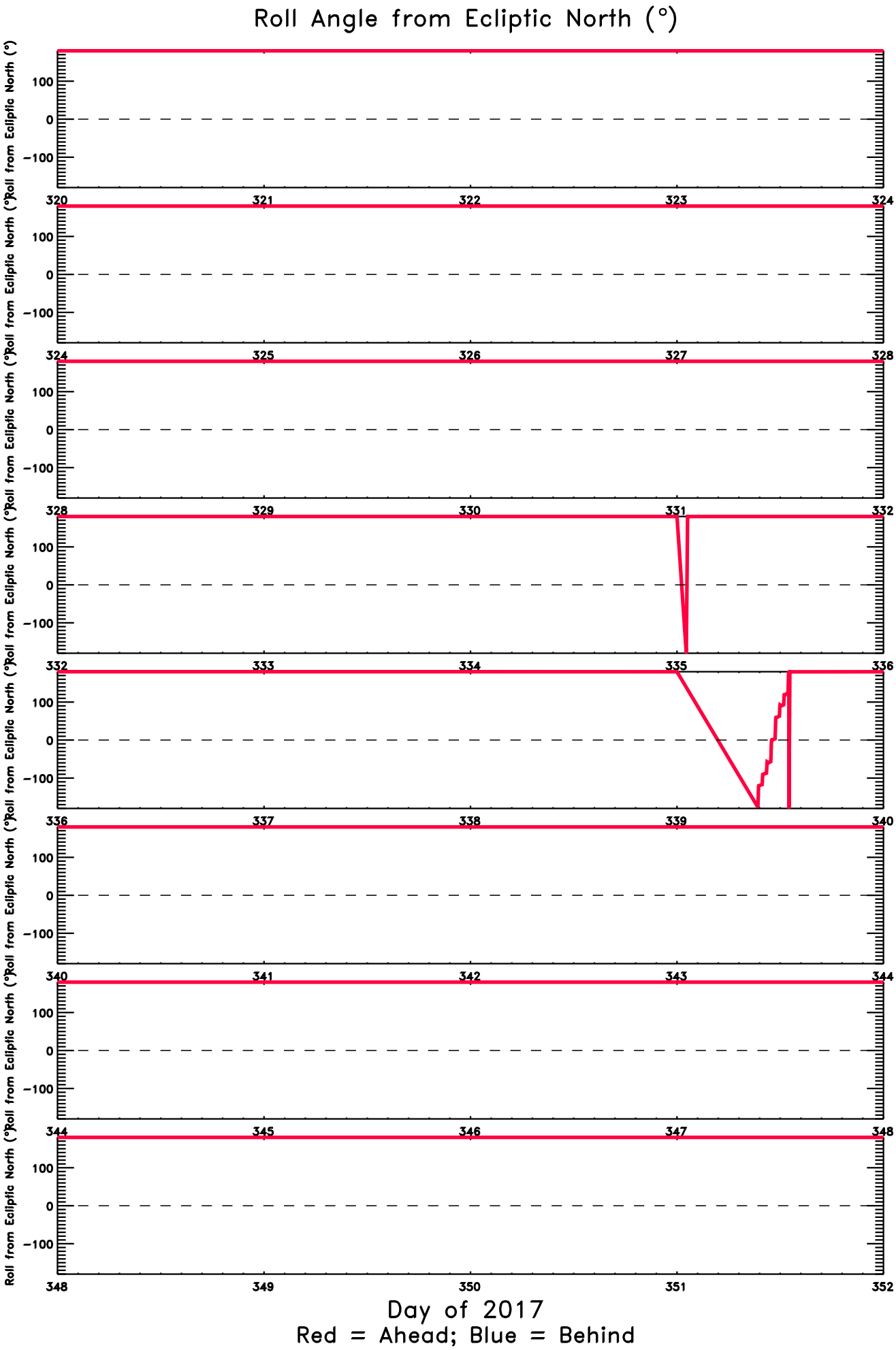
Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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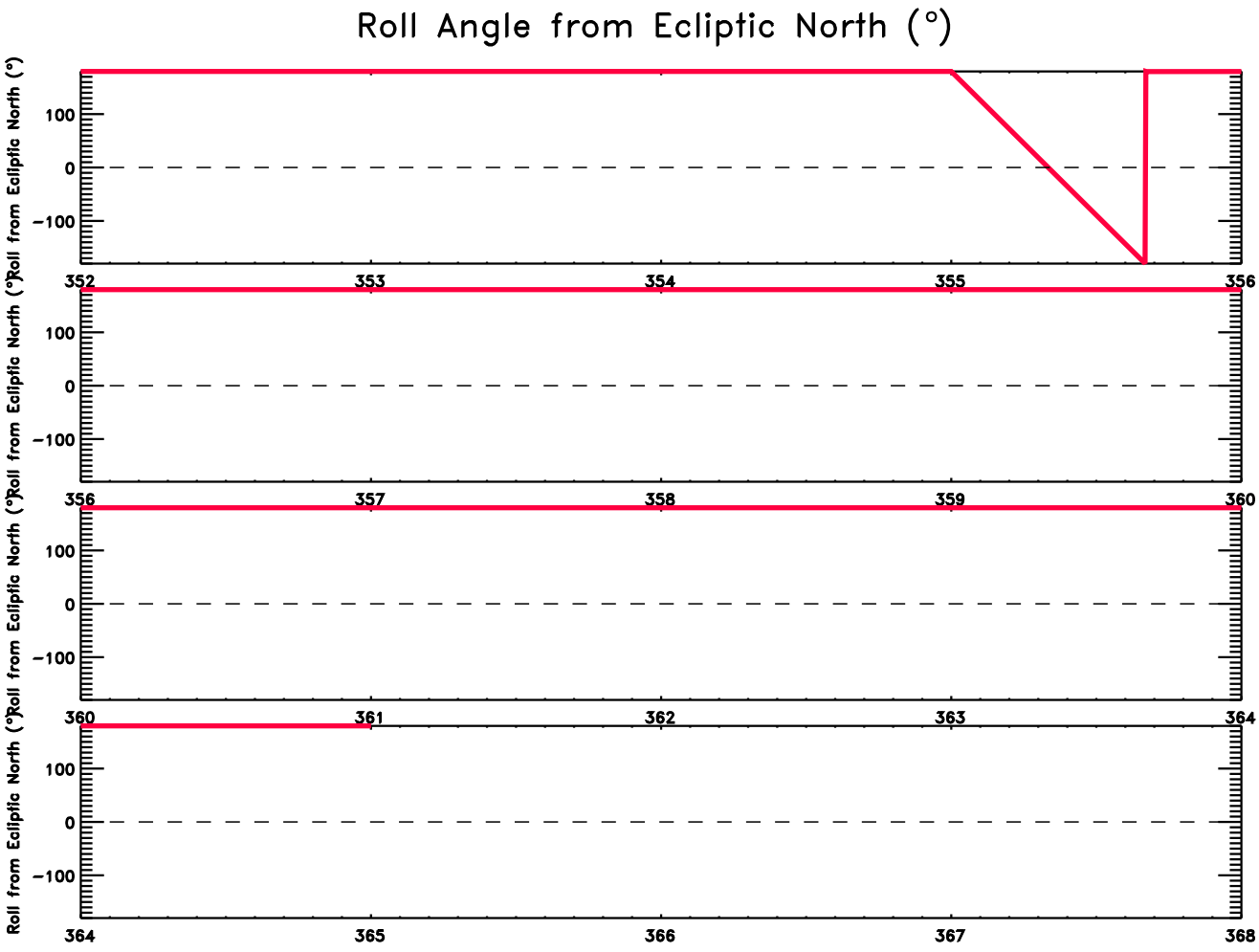
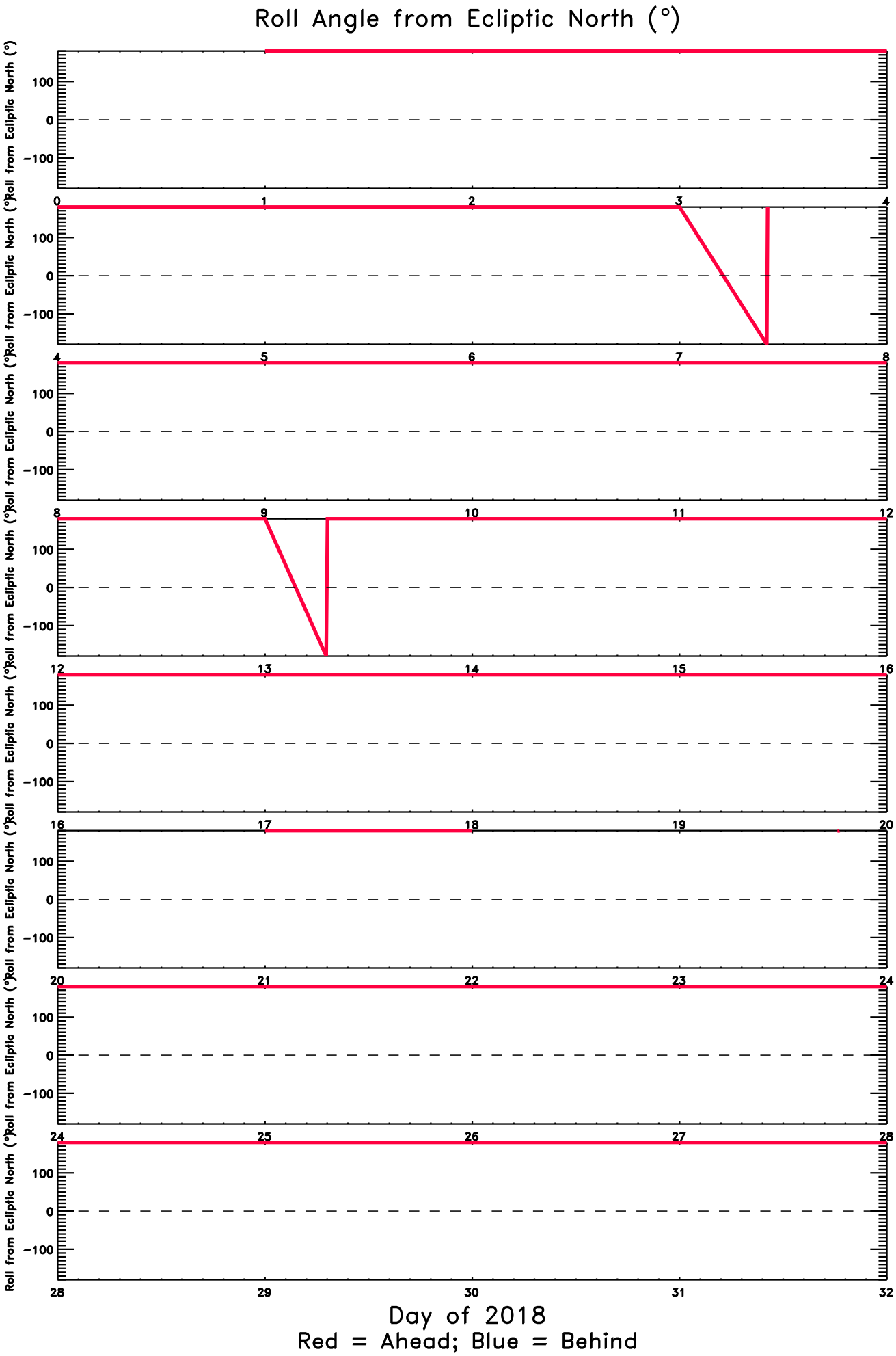
Day of 2017
Red = Ahead; Blue = Behind



Day of 2017
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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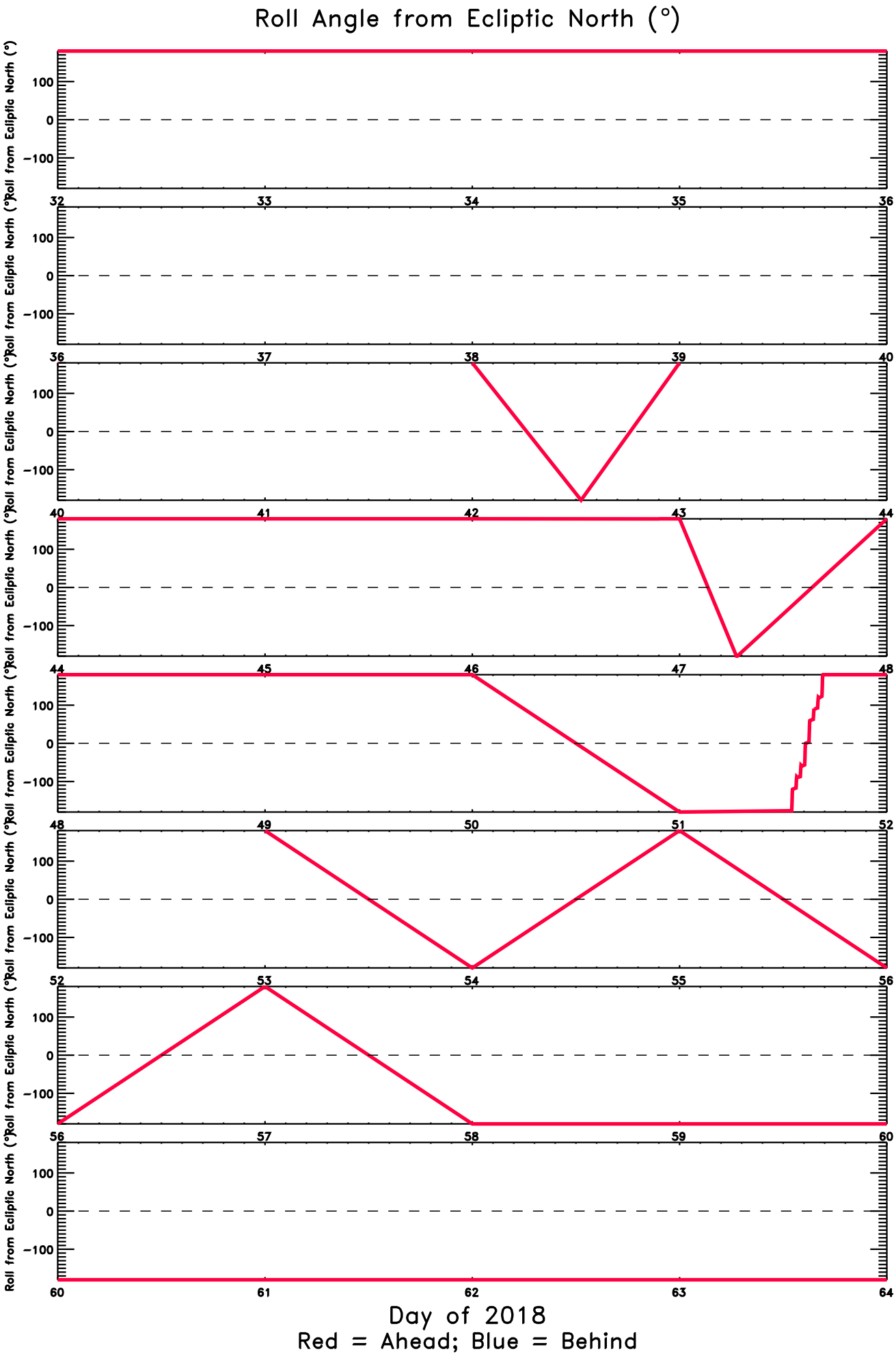
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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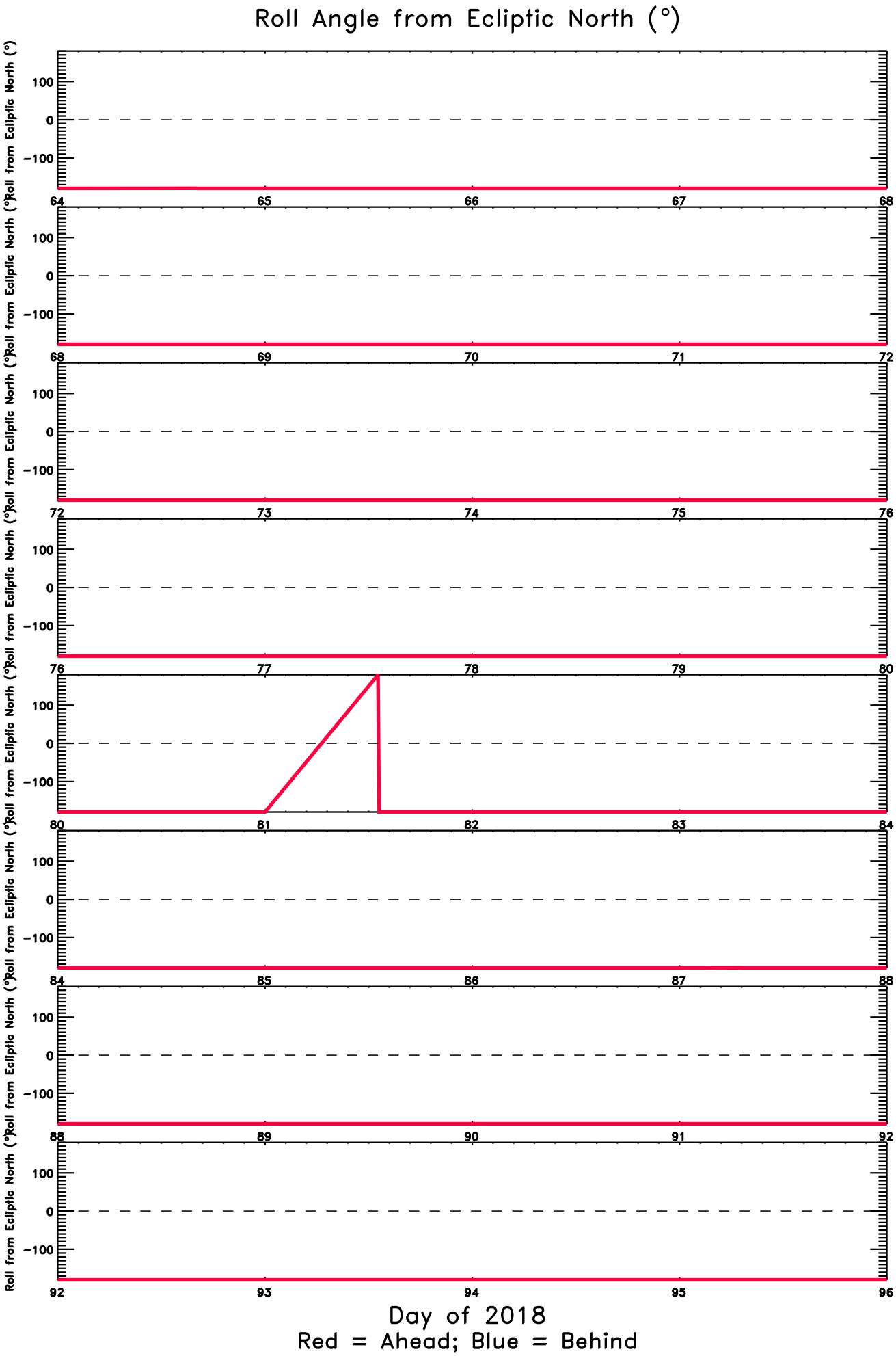
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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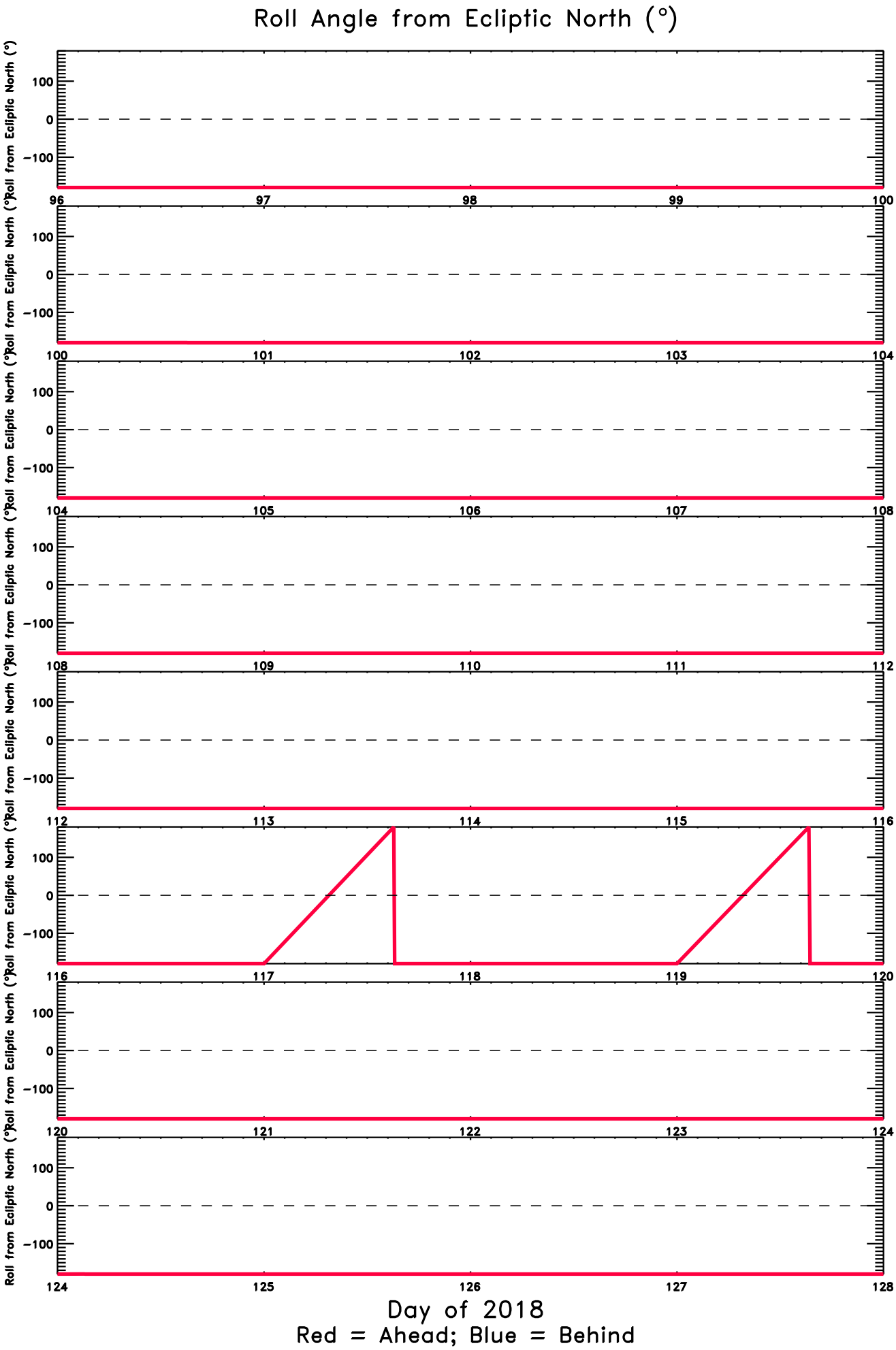
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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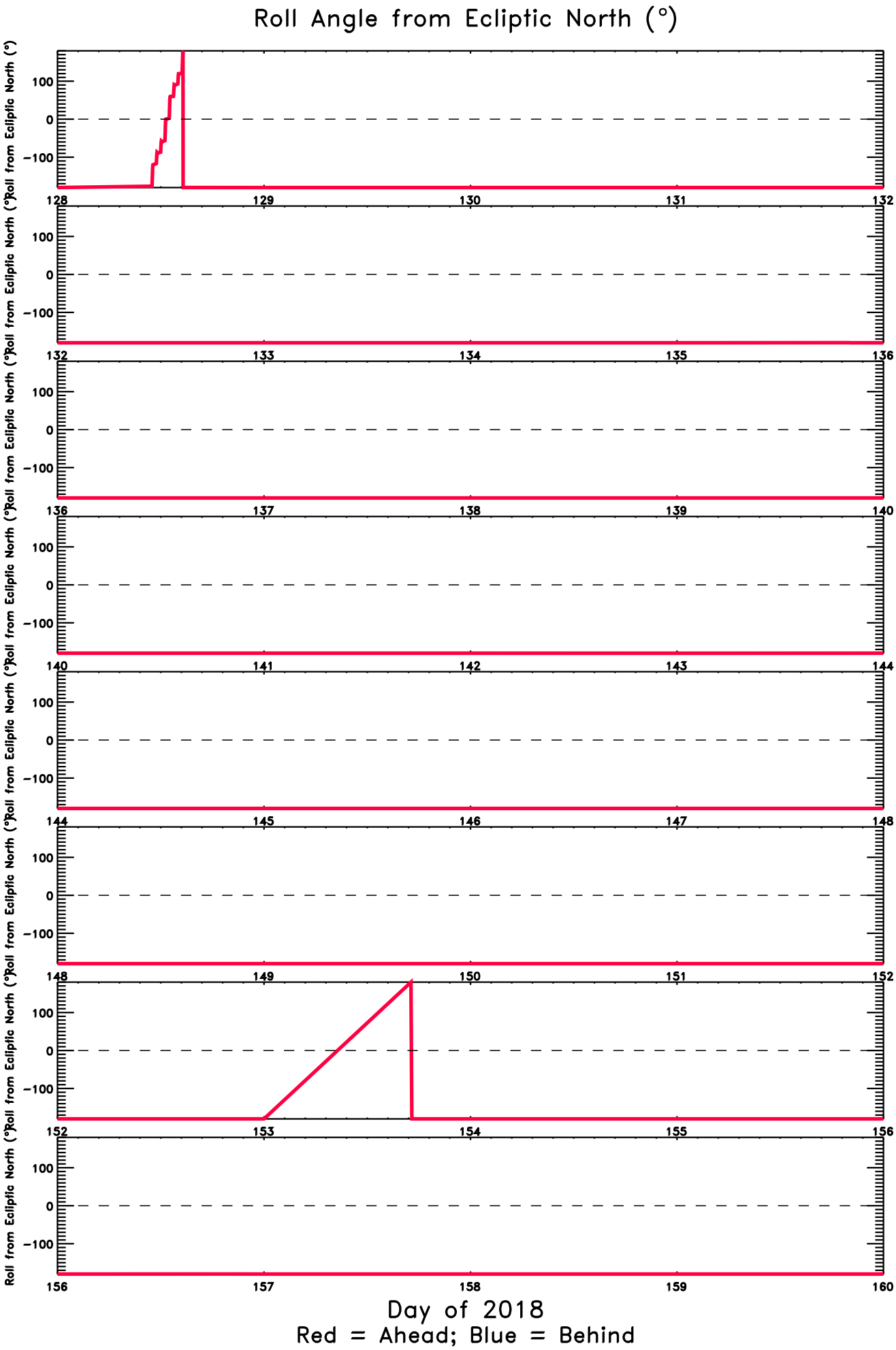
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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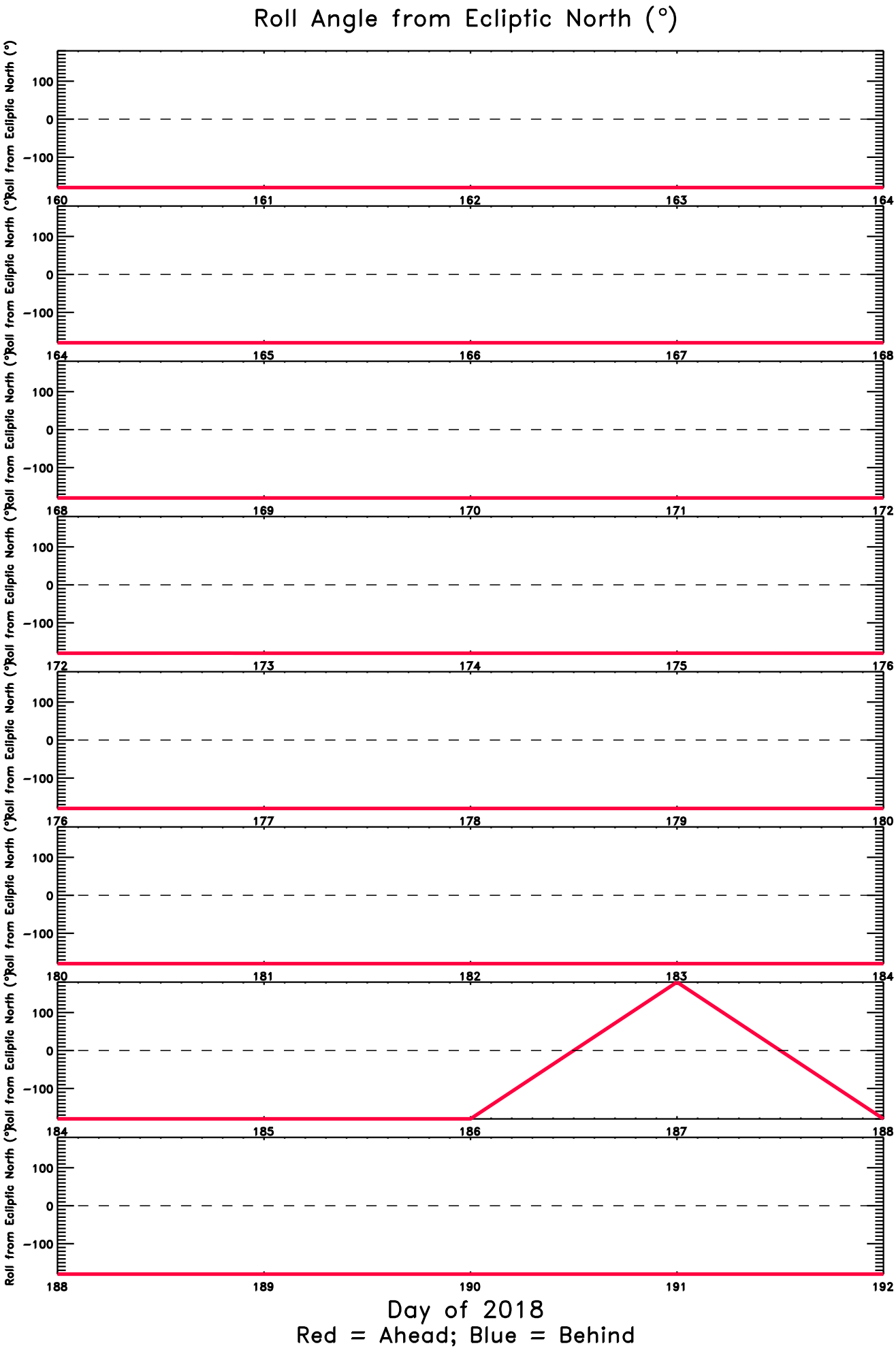
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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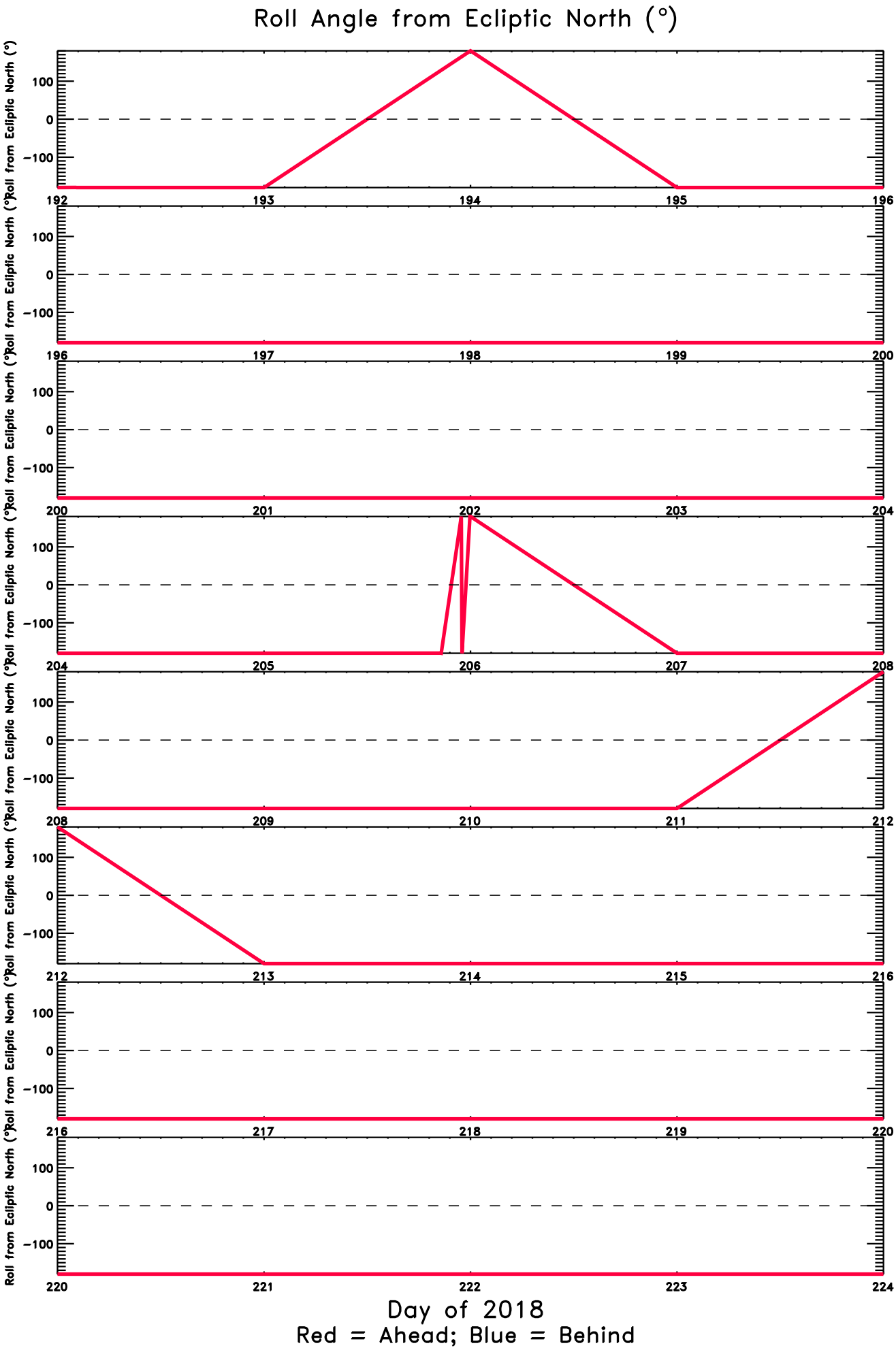
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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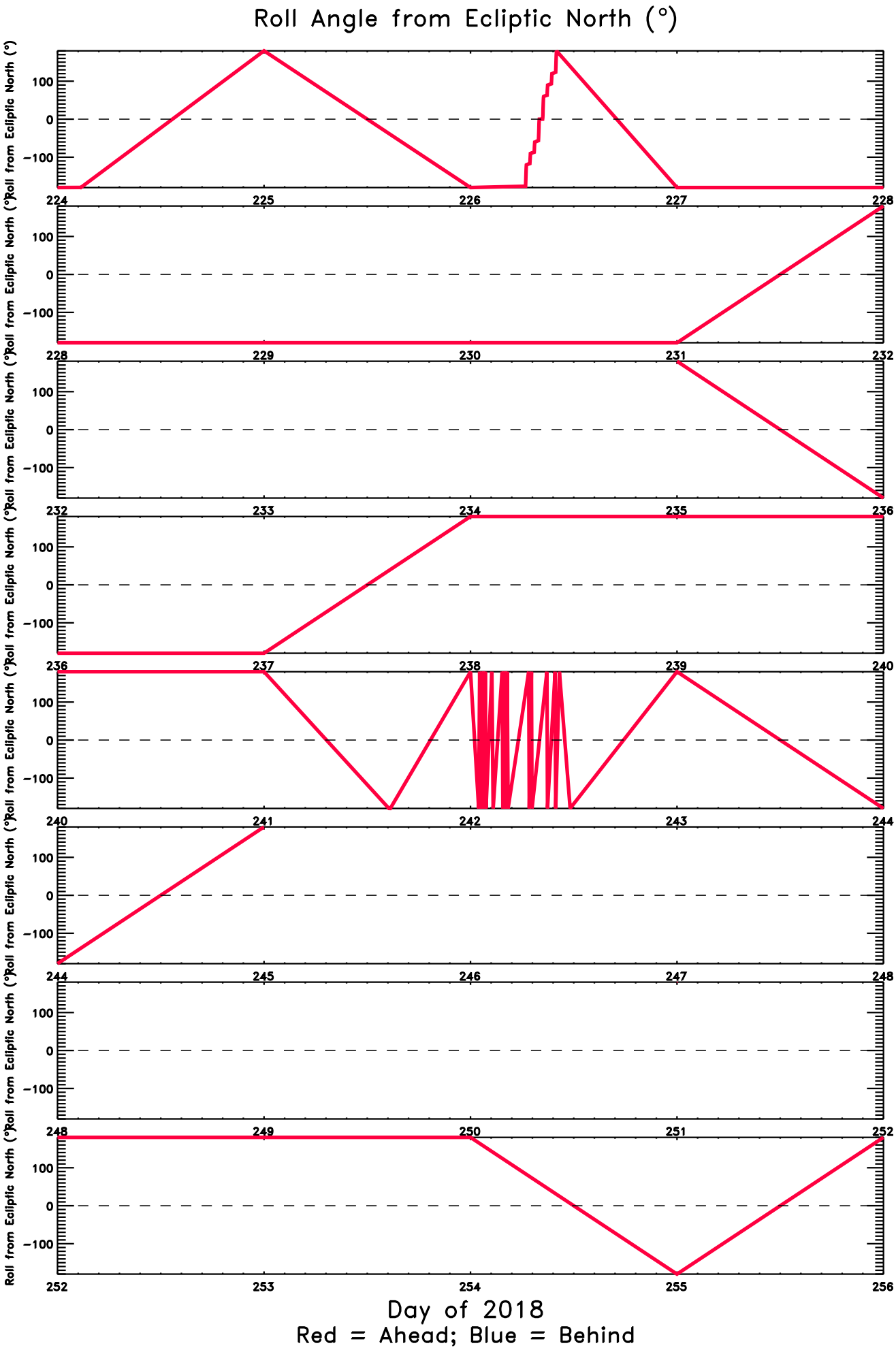
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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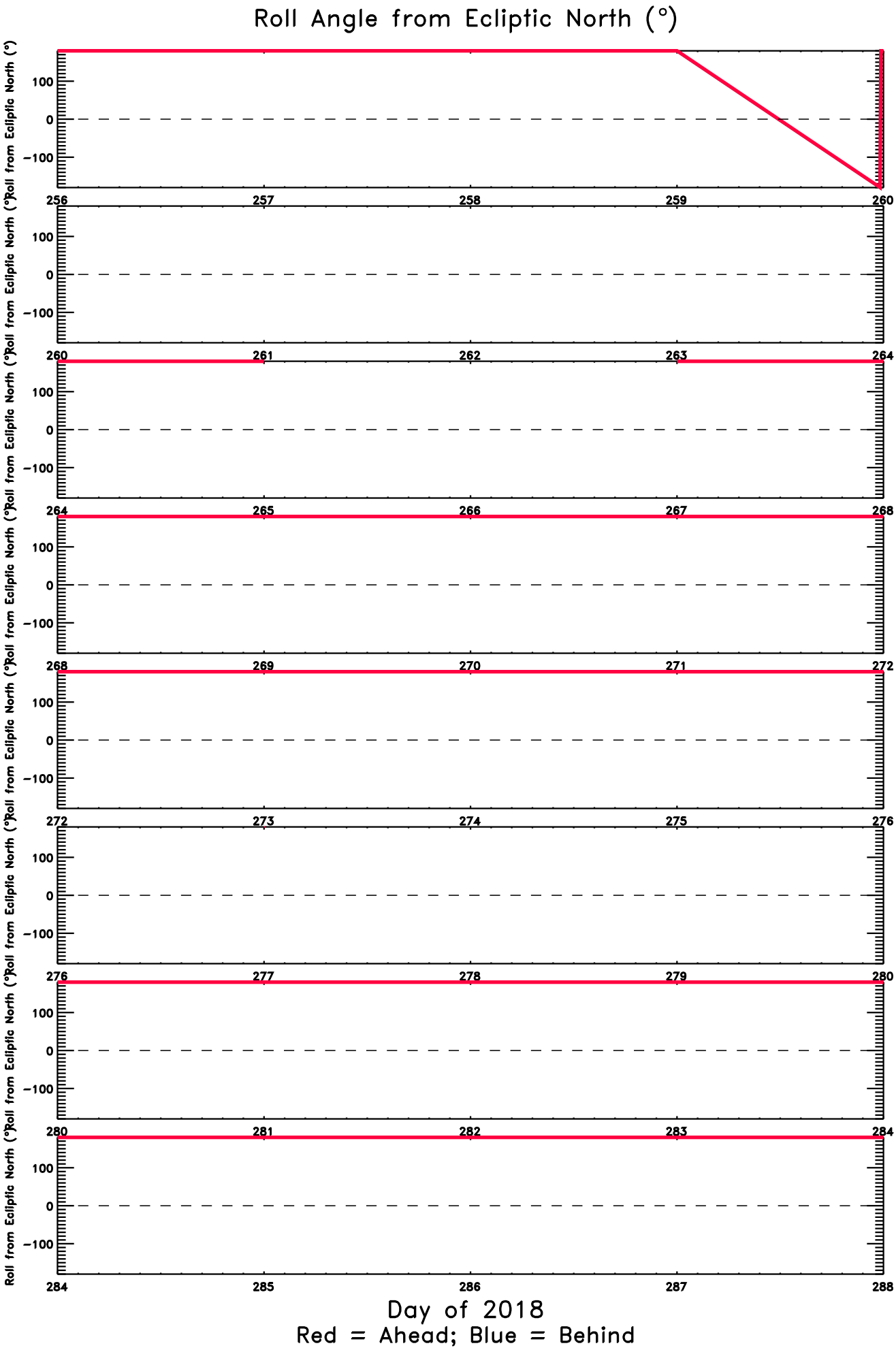
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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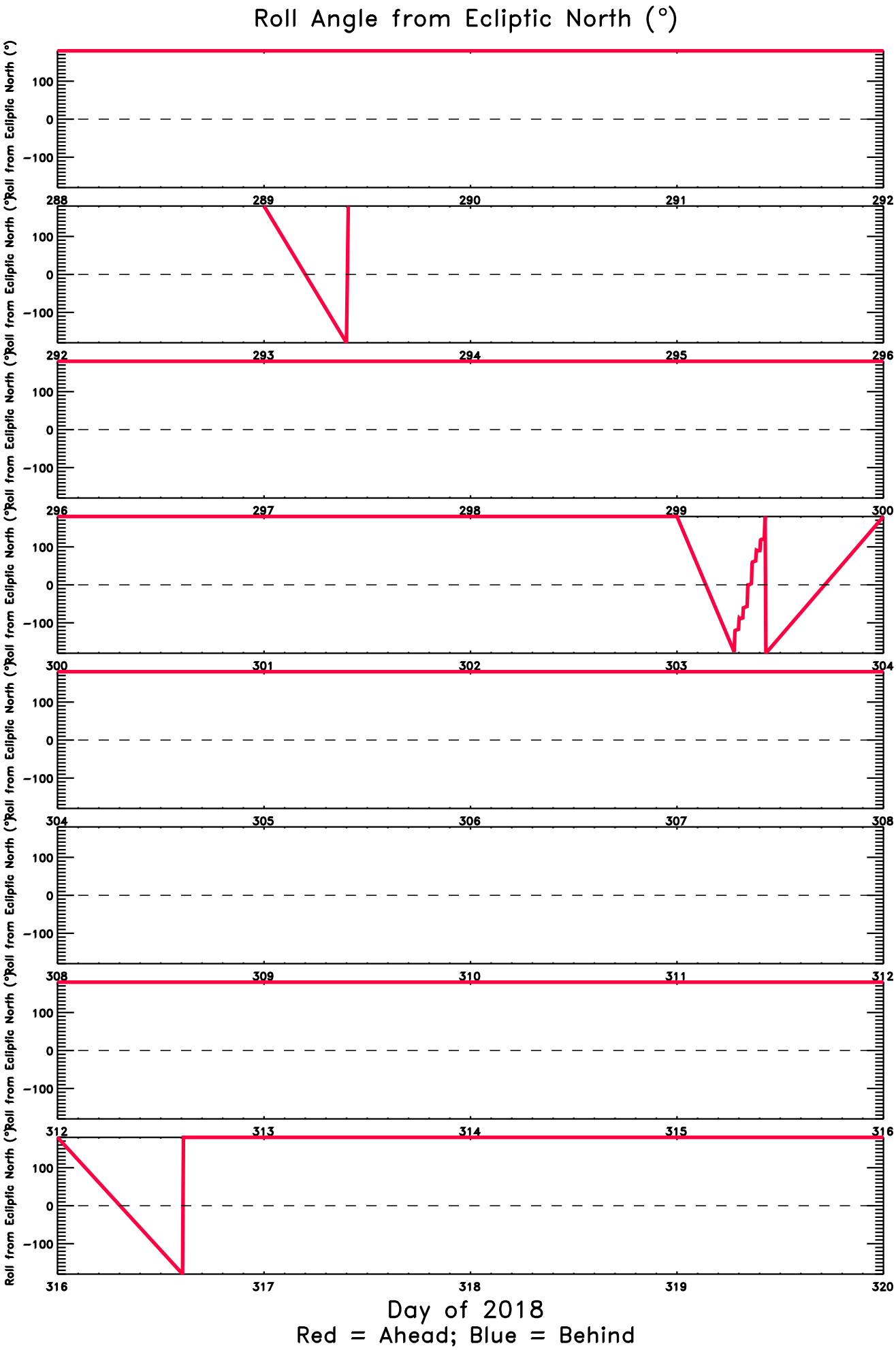
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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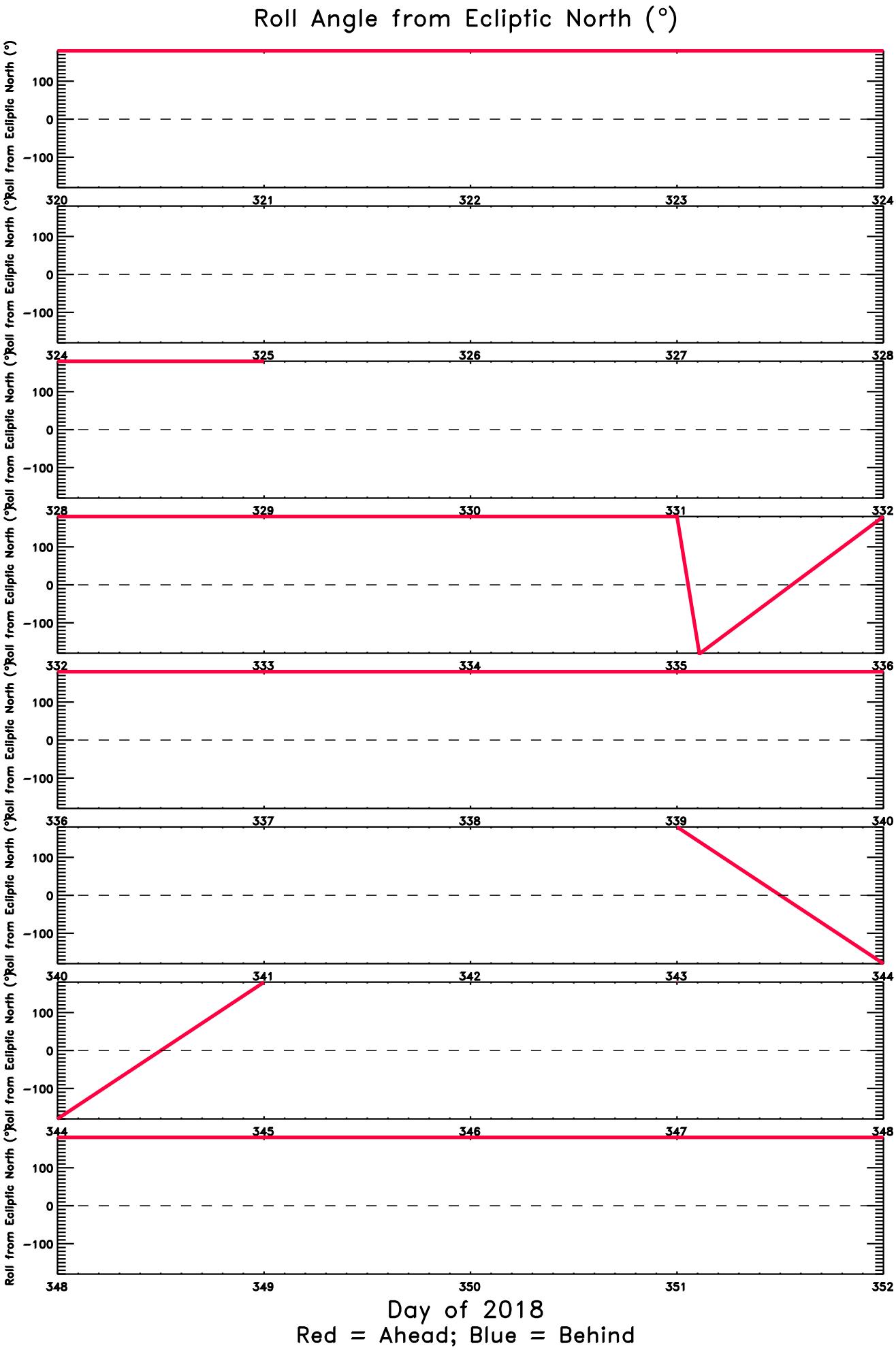
Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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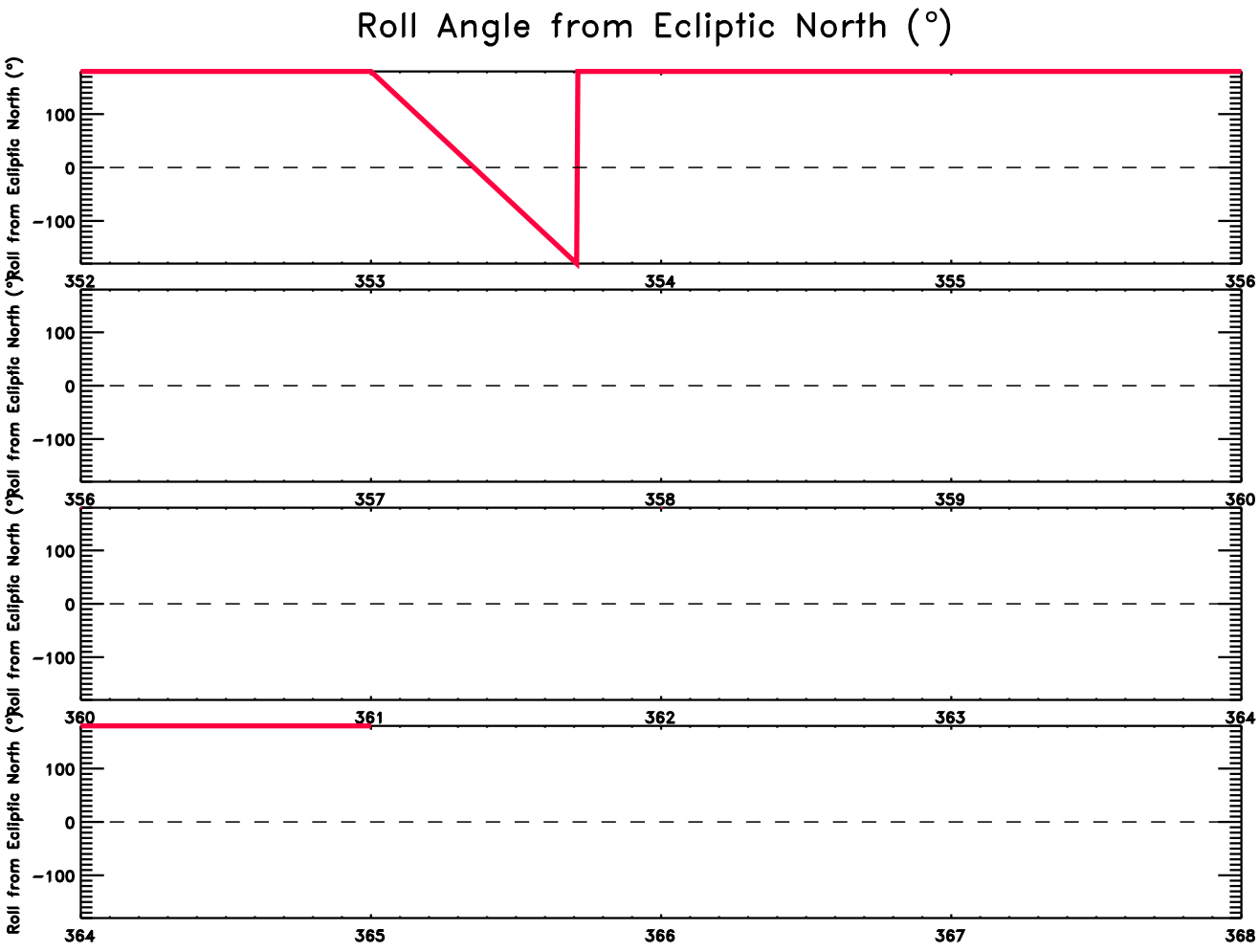
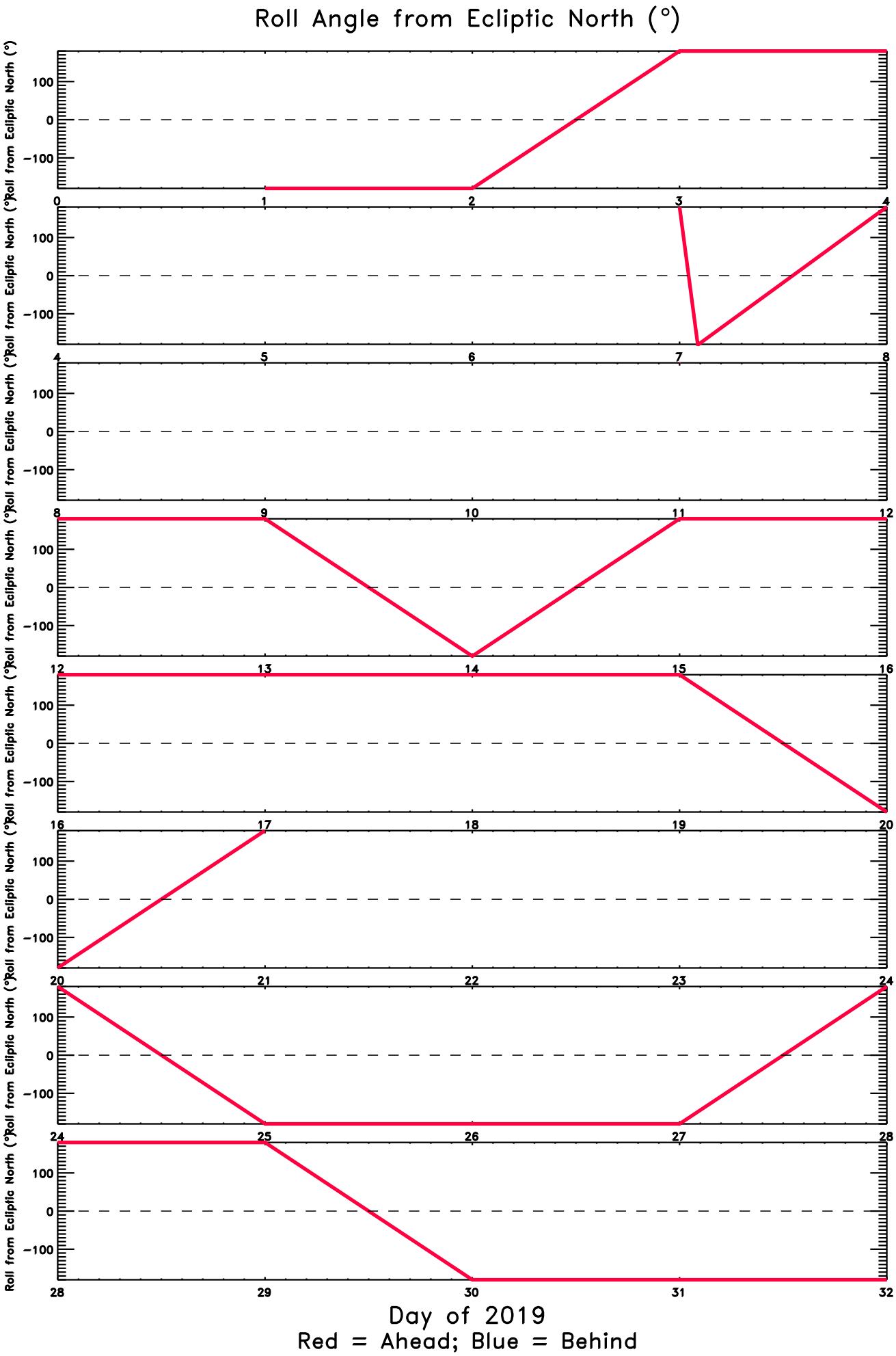
Day of 2018
Red = Ahead; Blue = Behind



Day of 2018
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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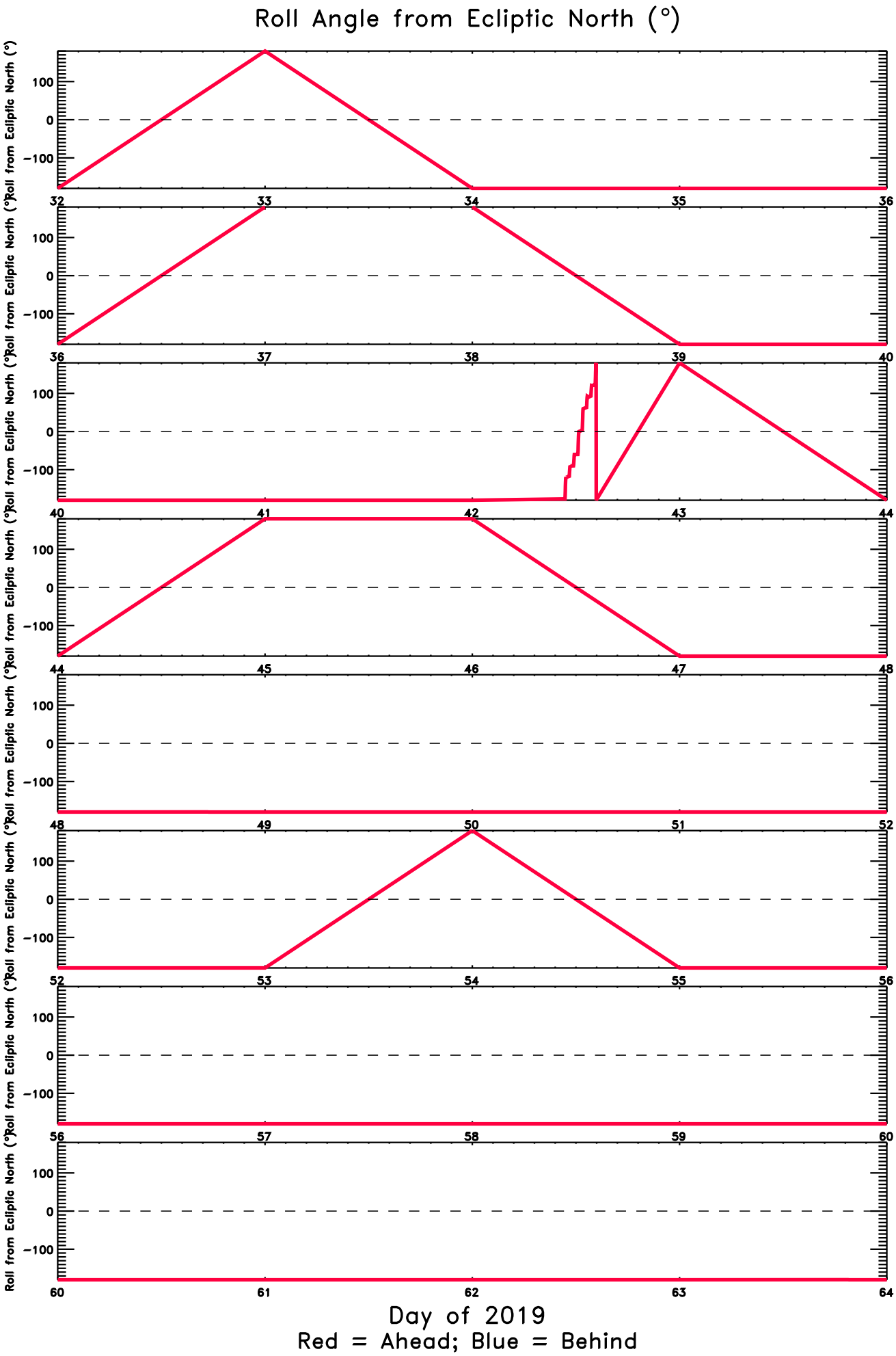
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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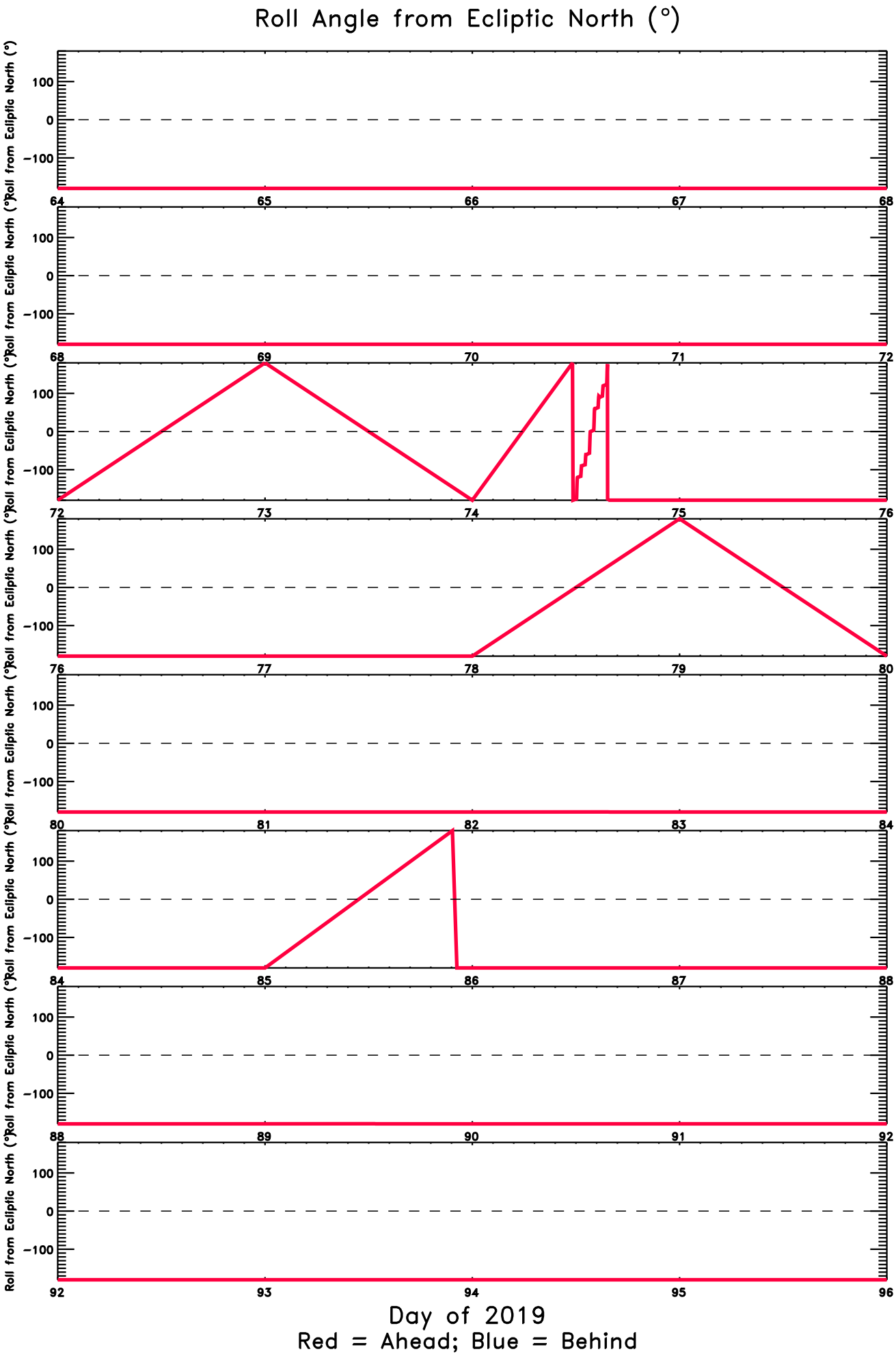
64
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
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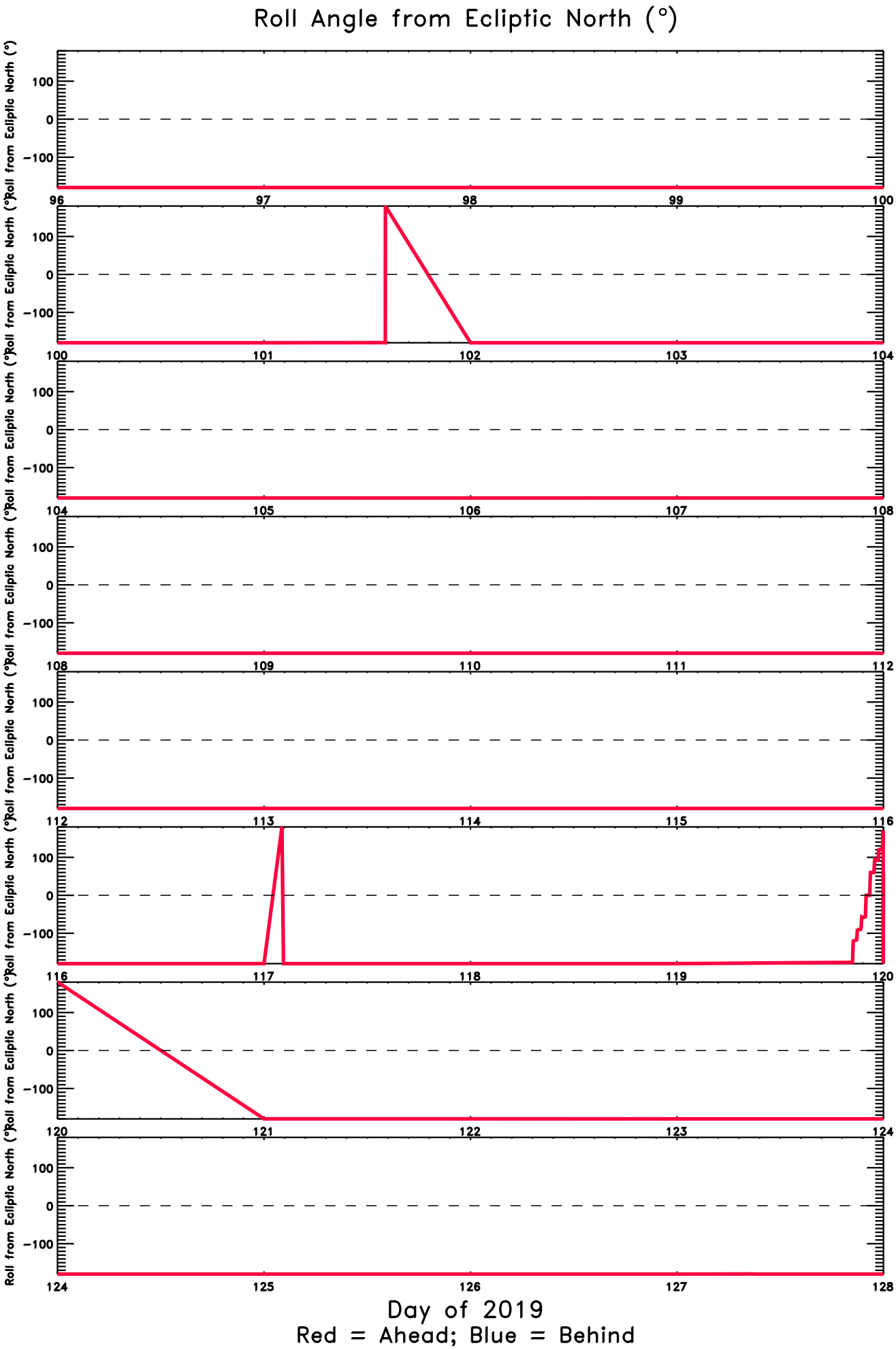
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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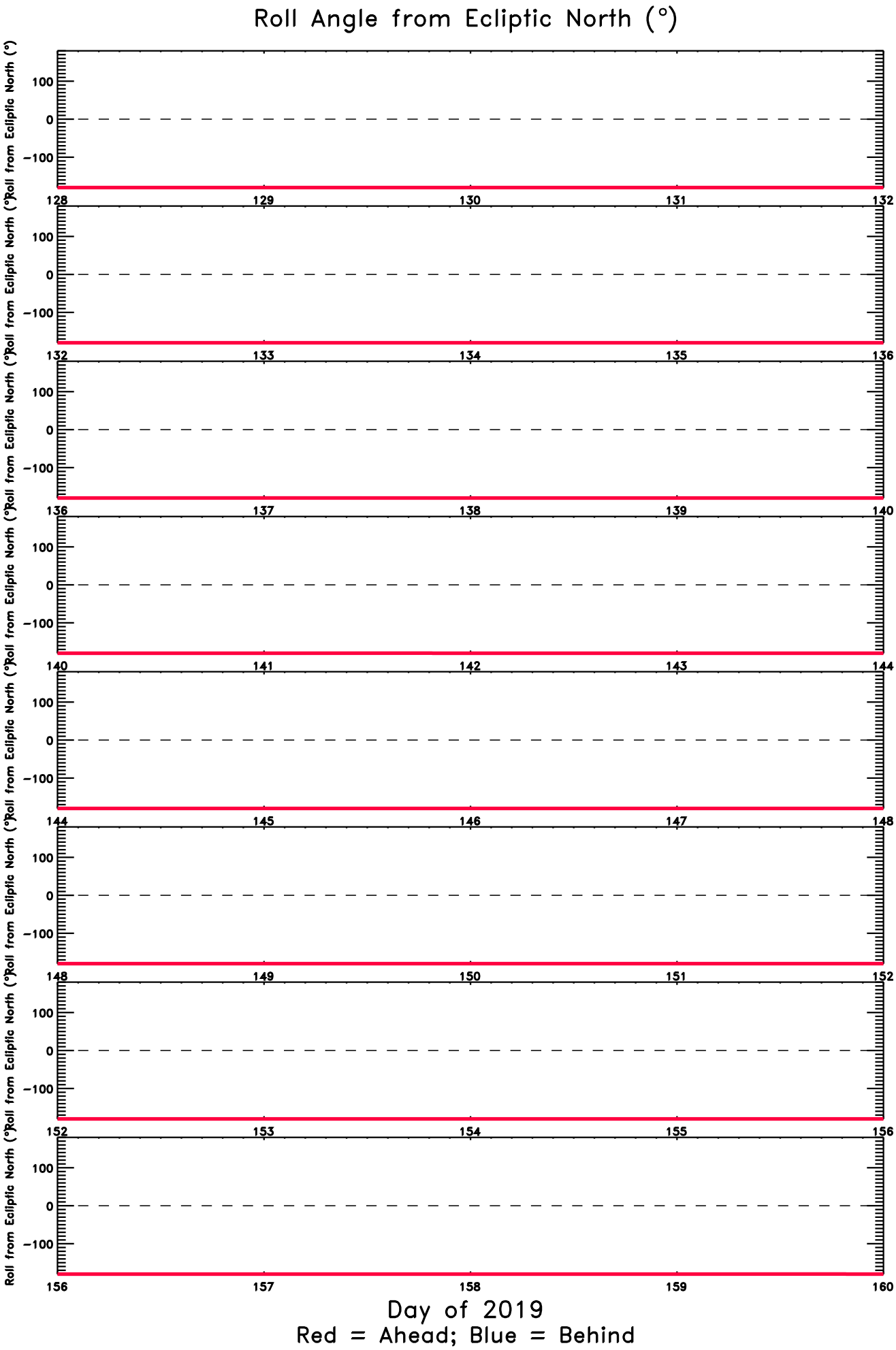
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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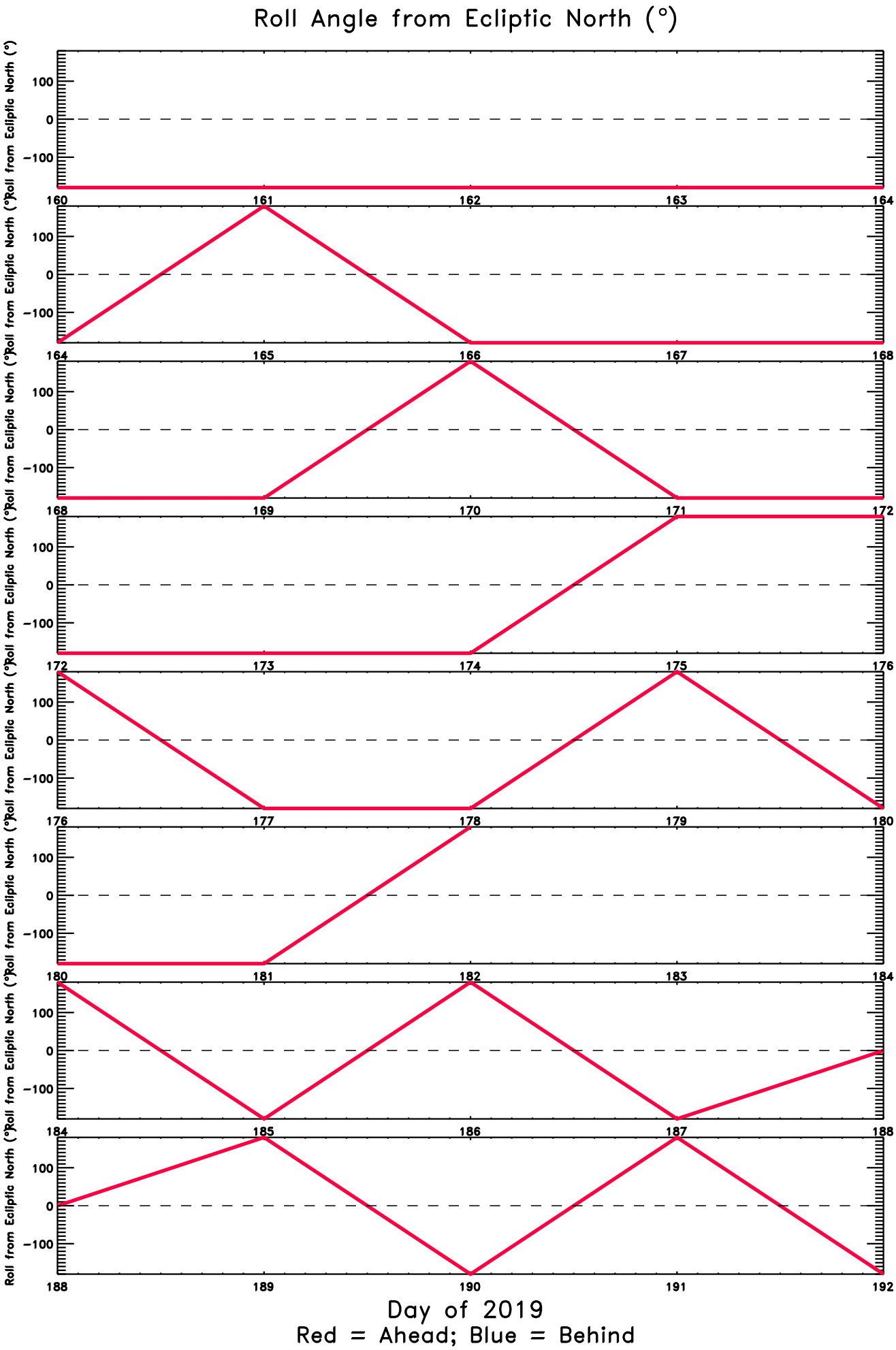
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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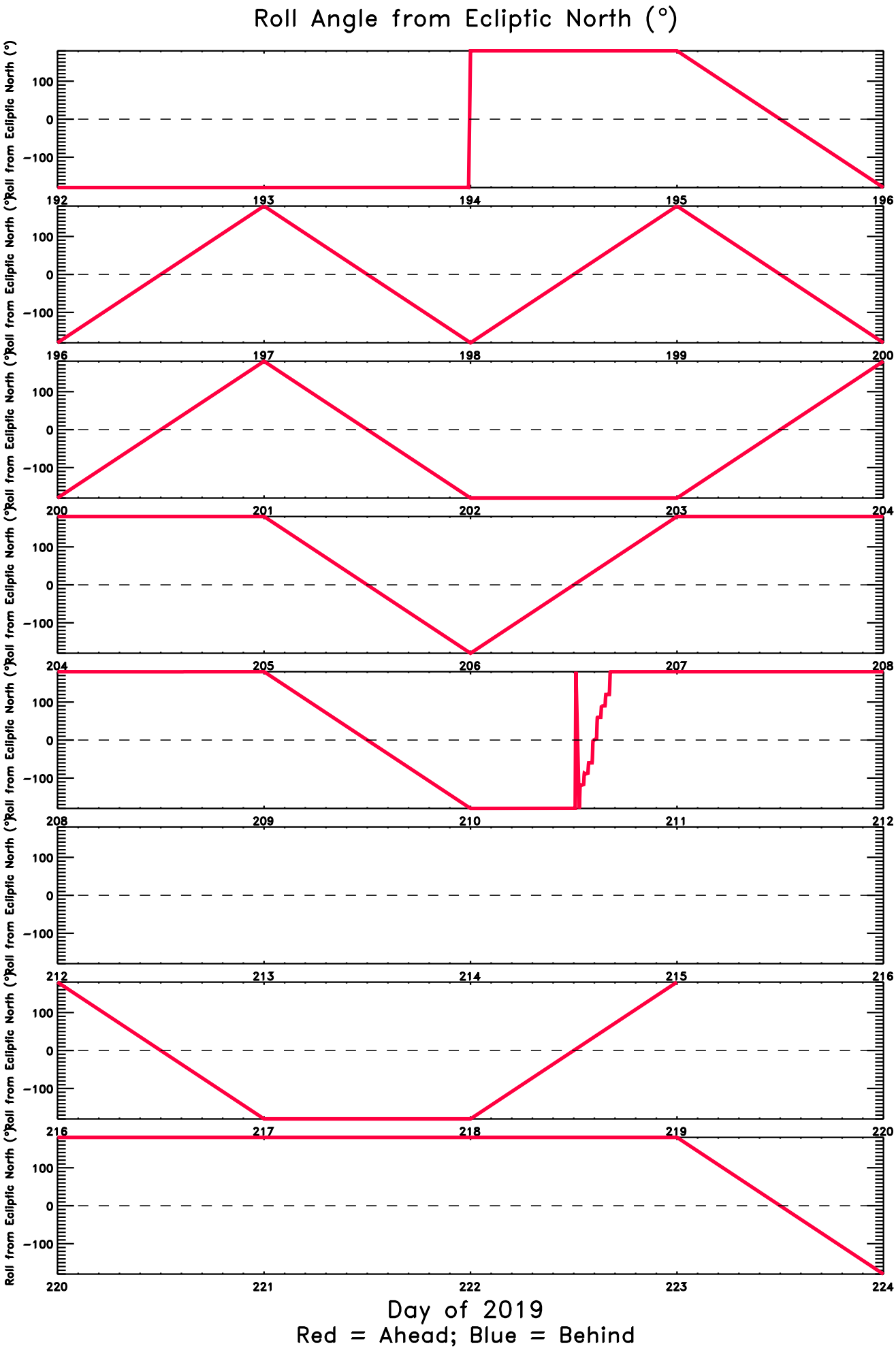
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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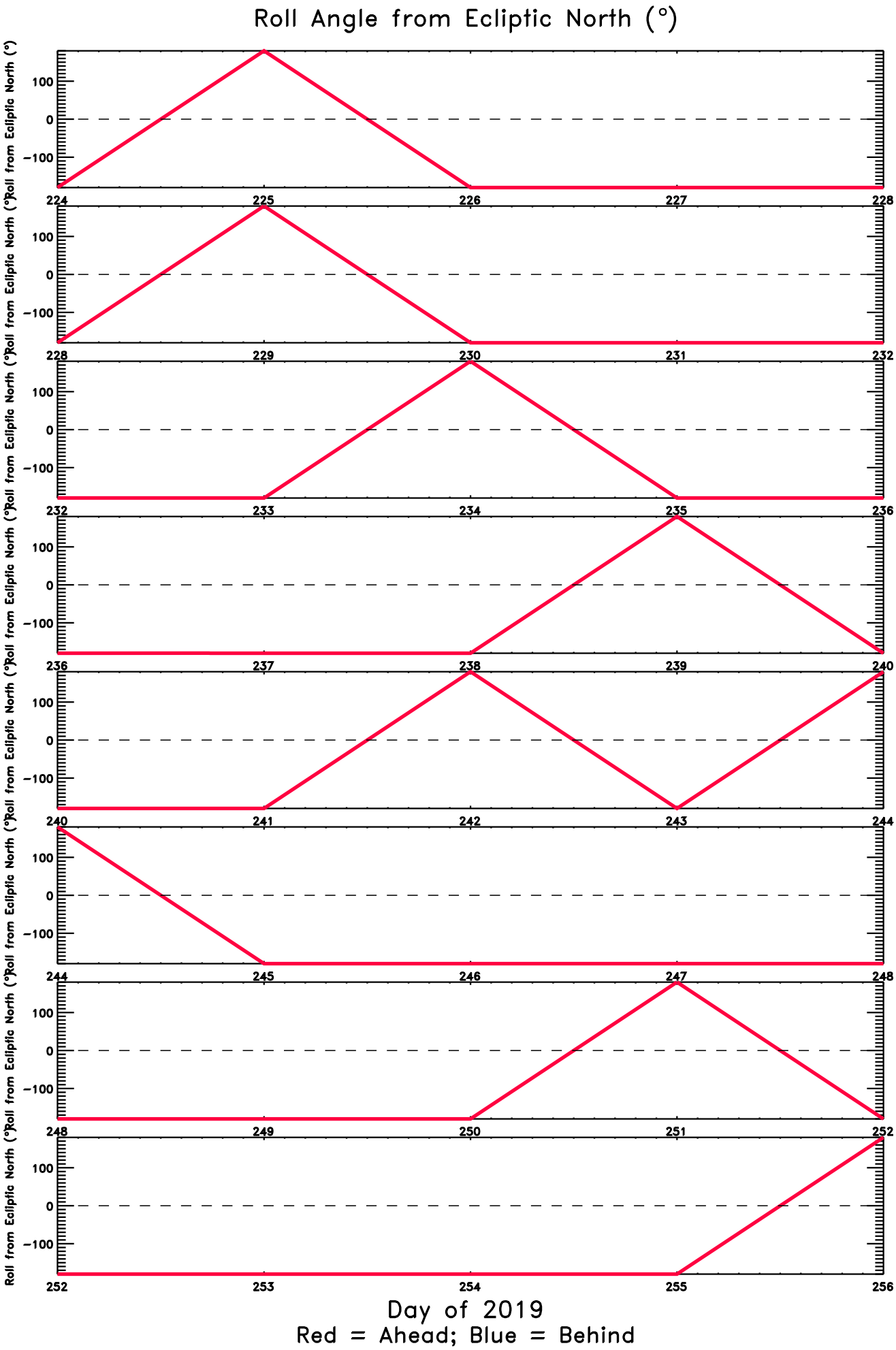
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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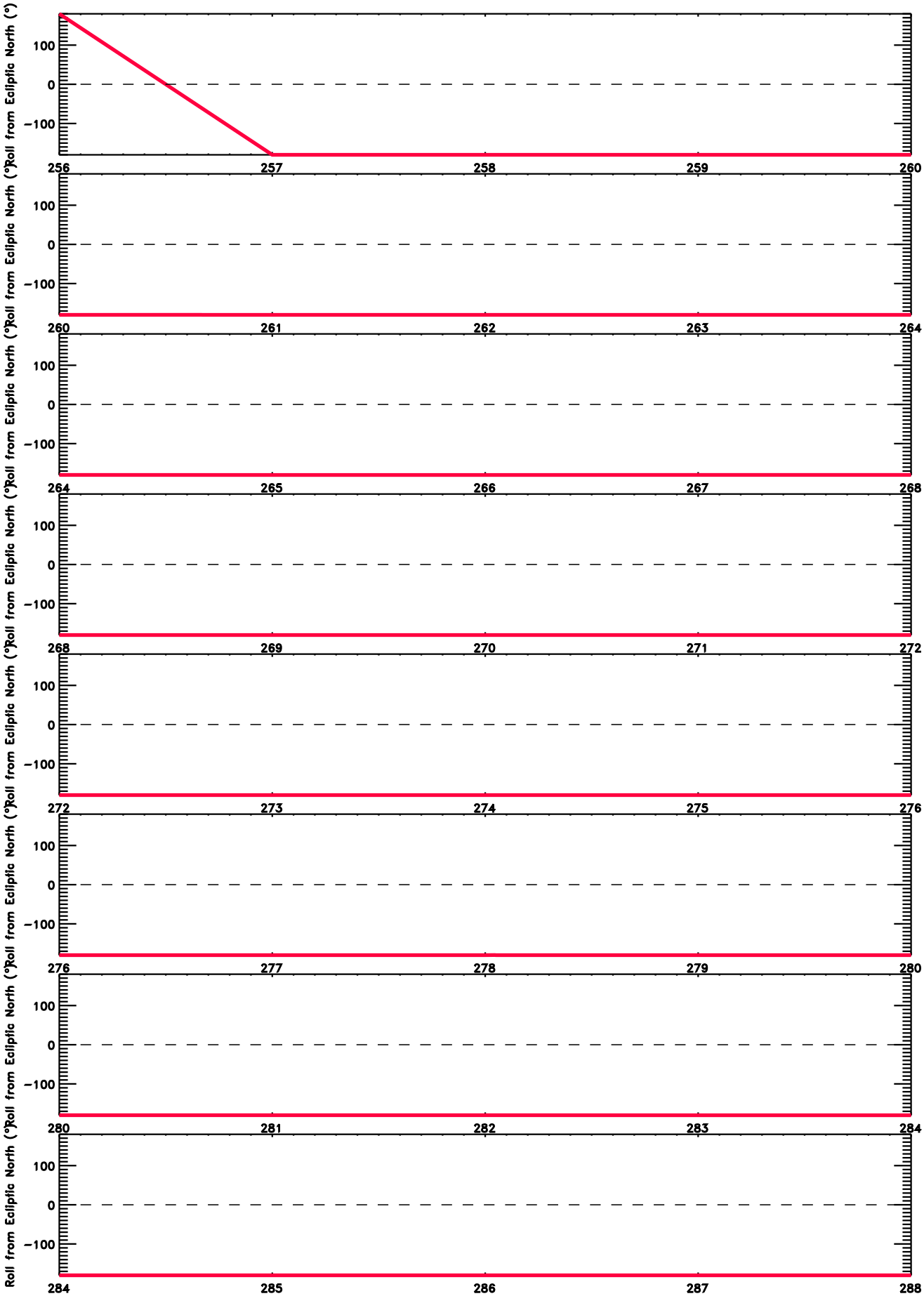
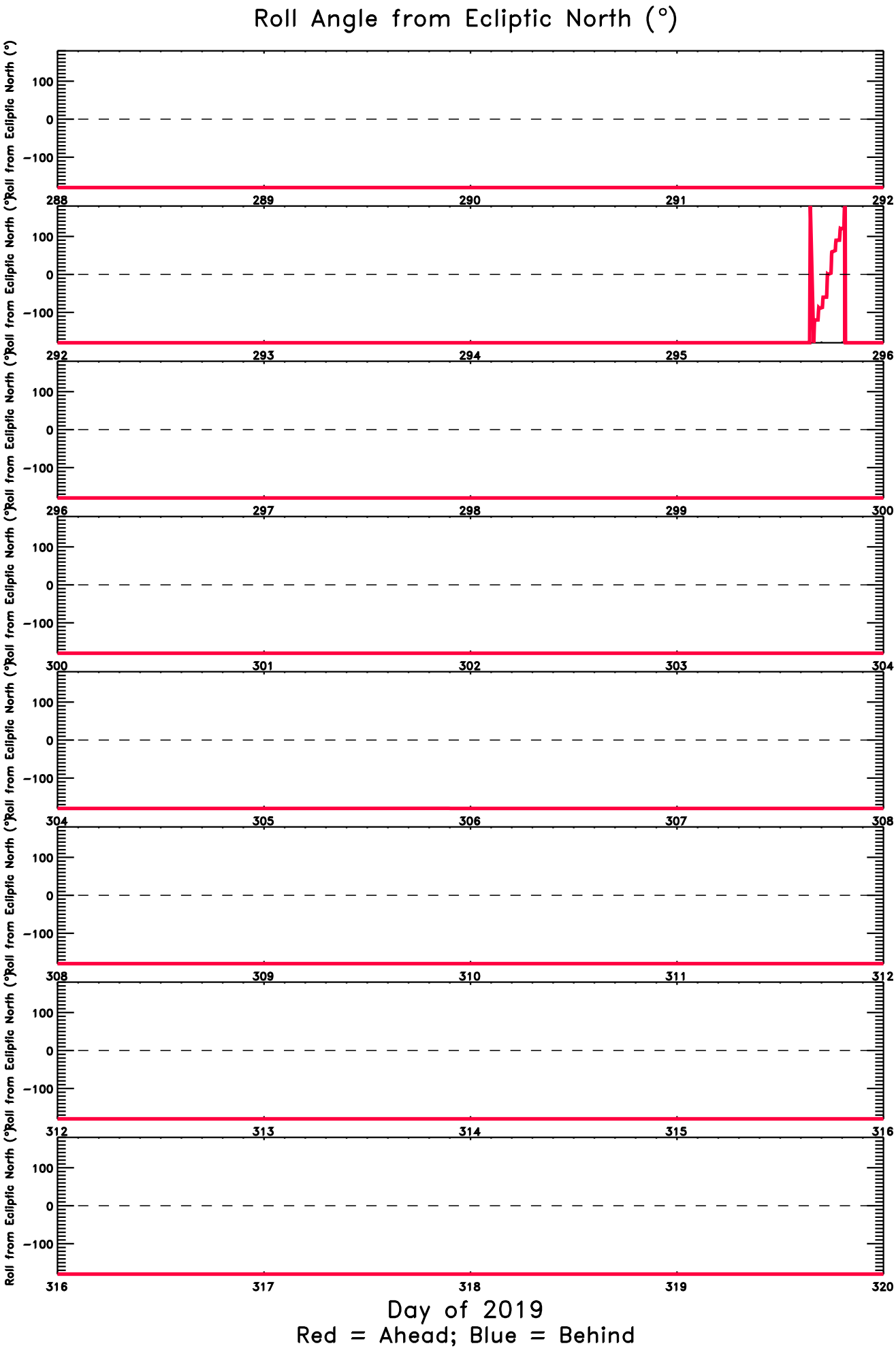
Day of 2019
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2019

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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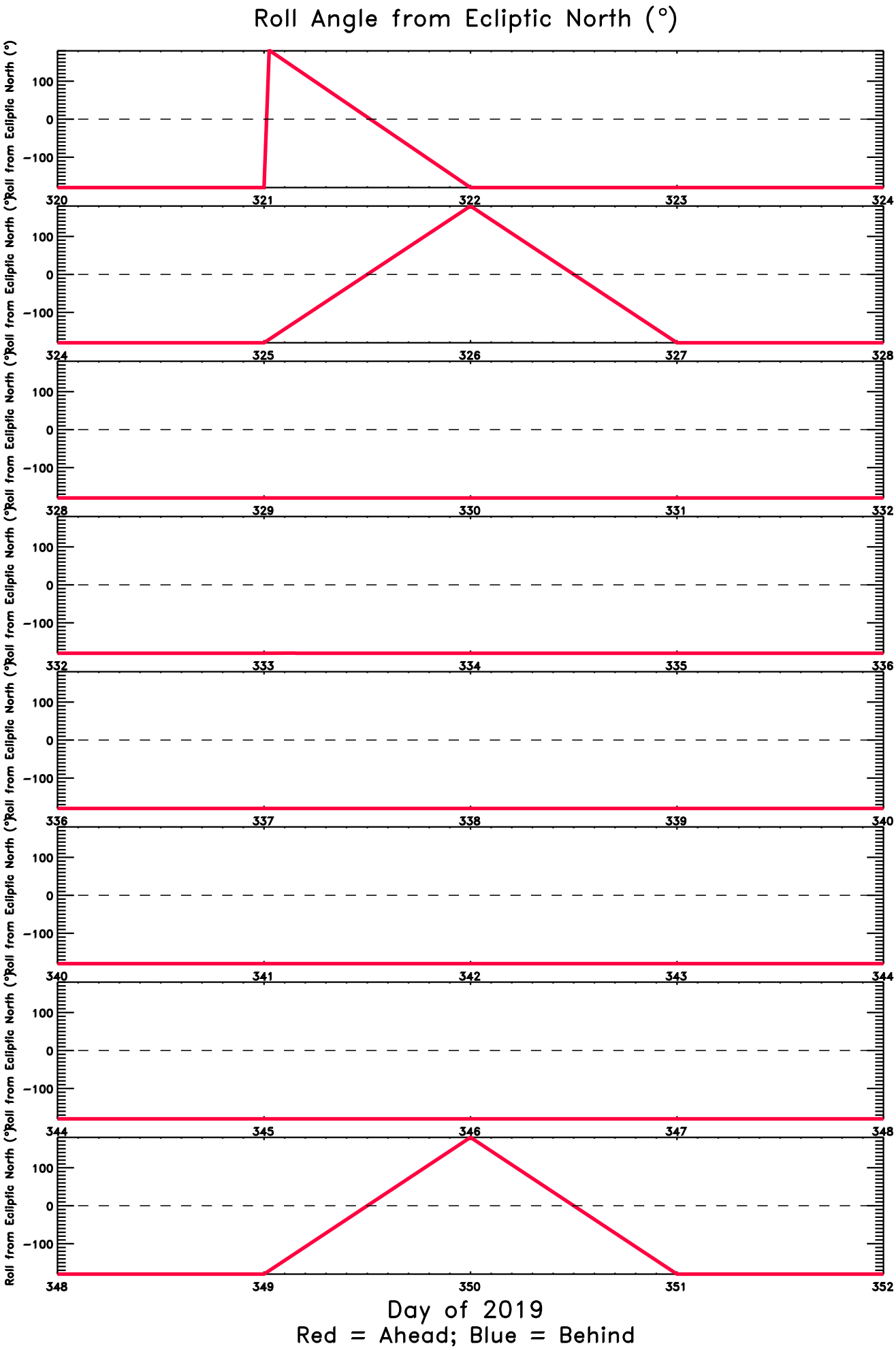
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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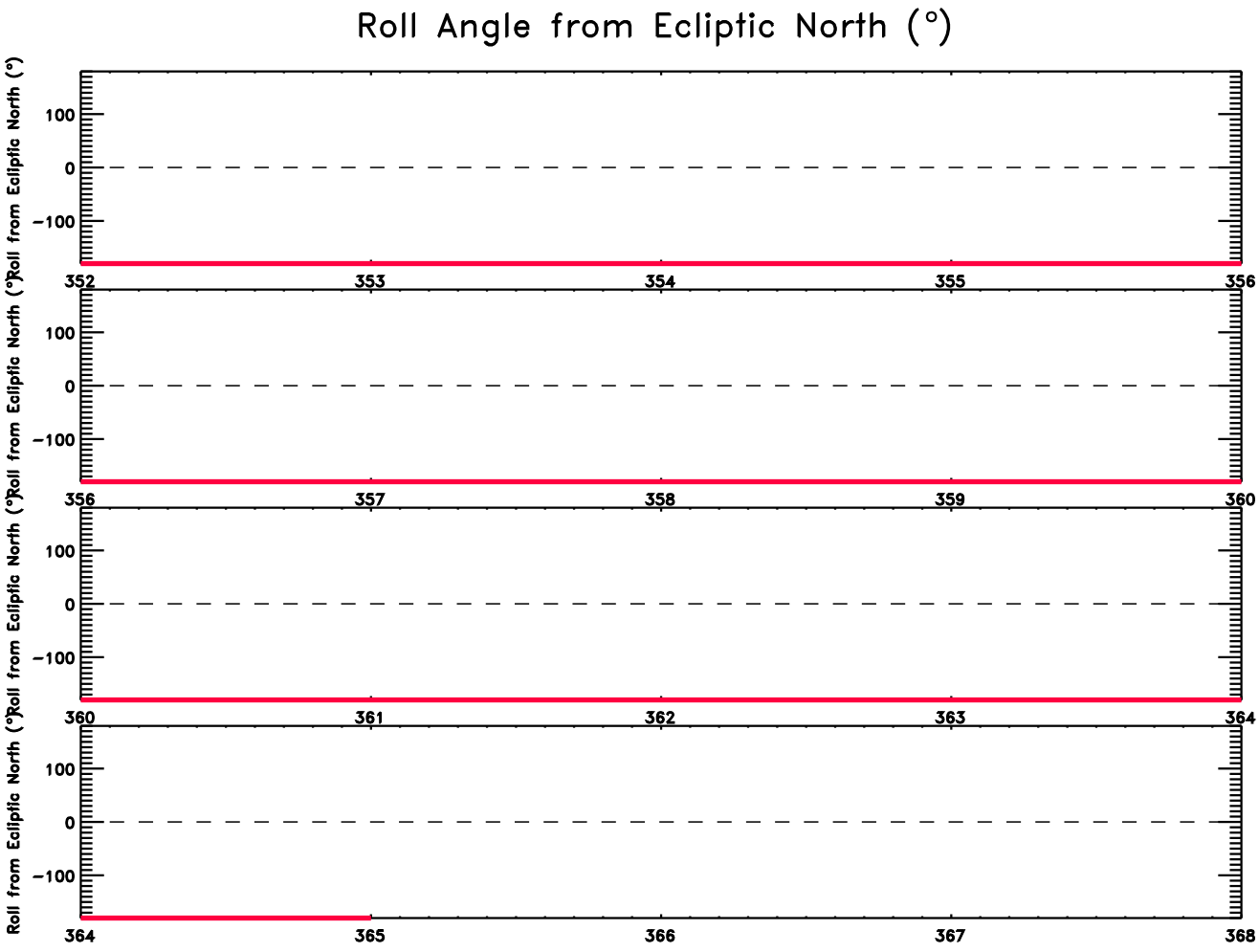
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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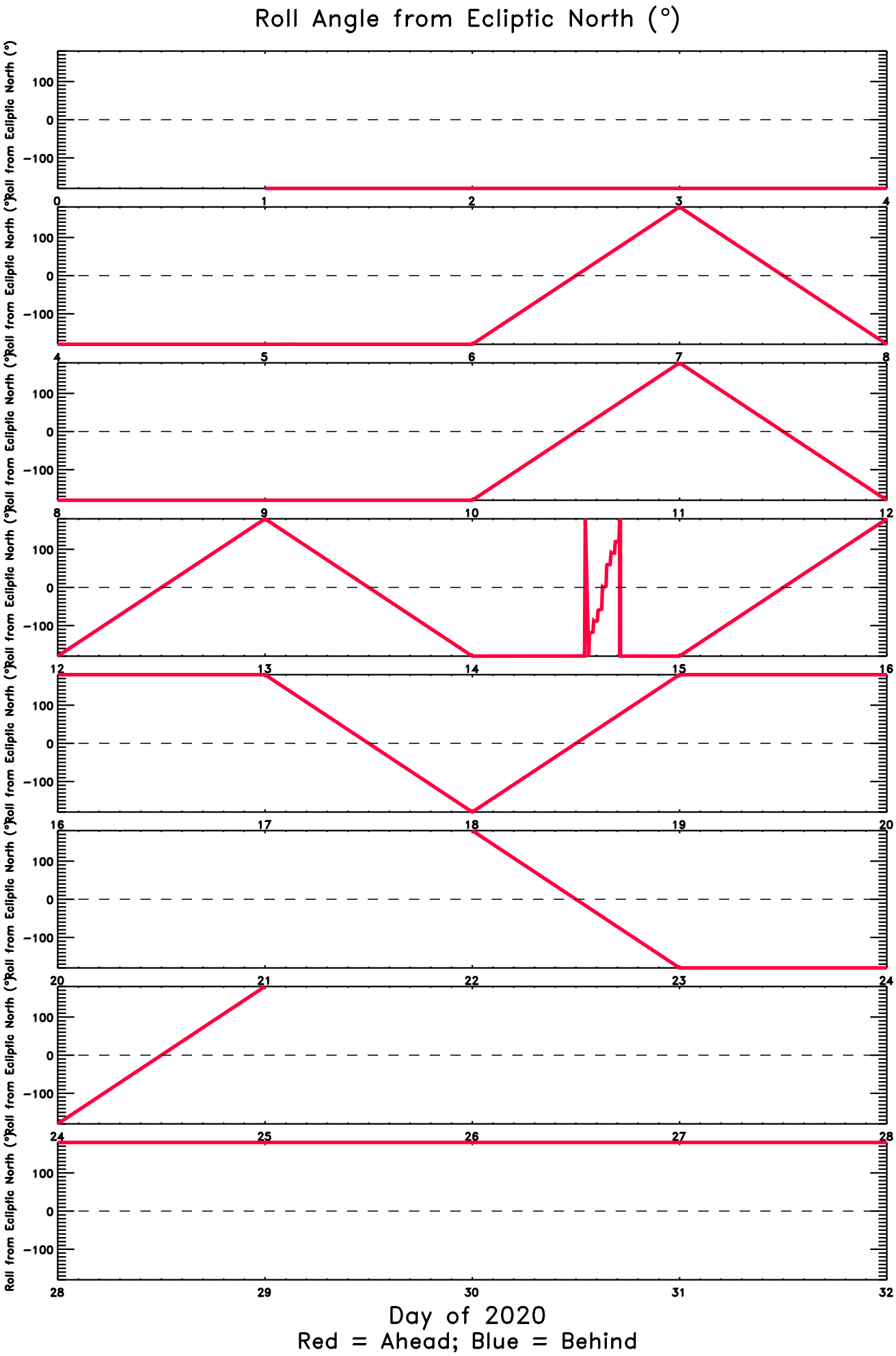
Day of 2019
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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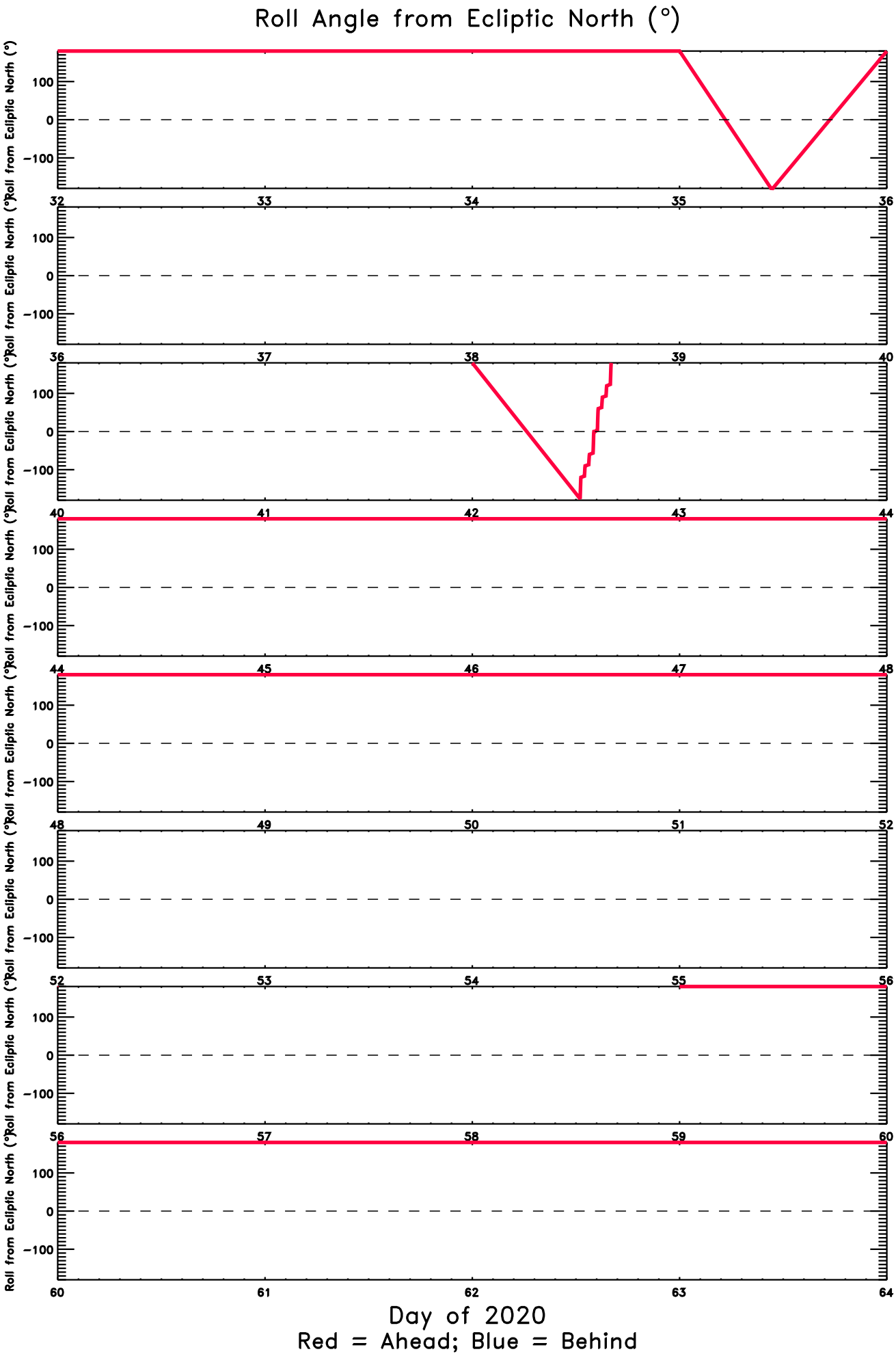
Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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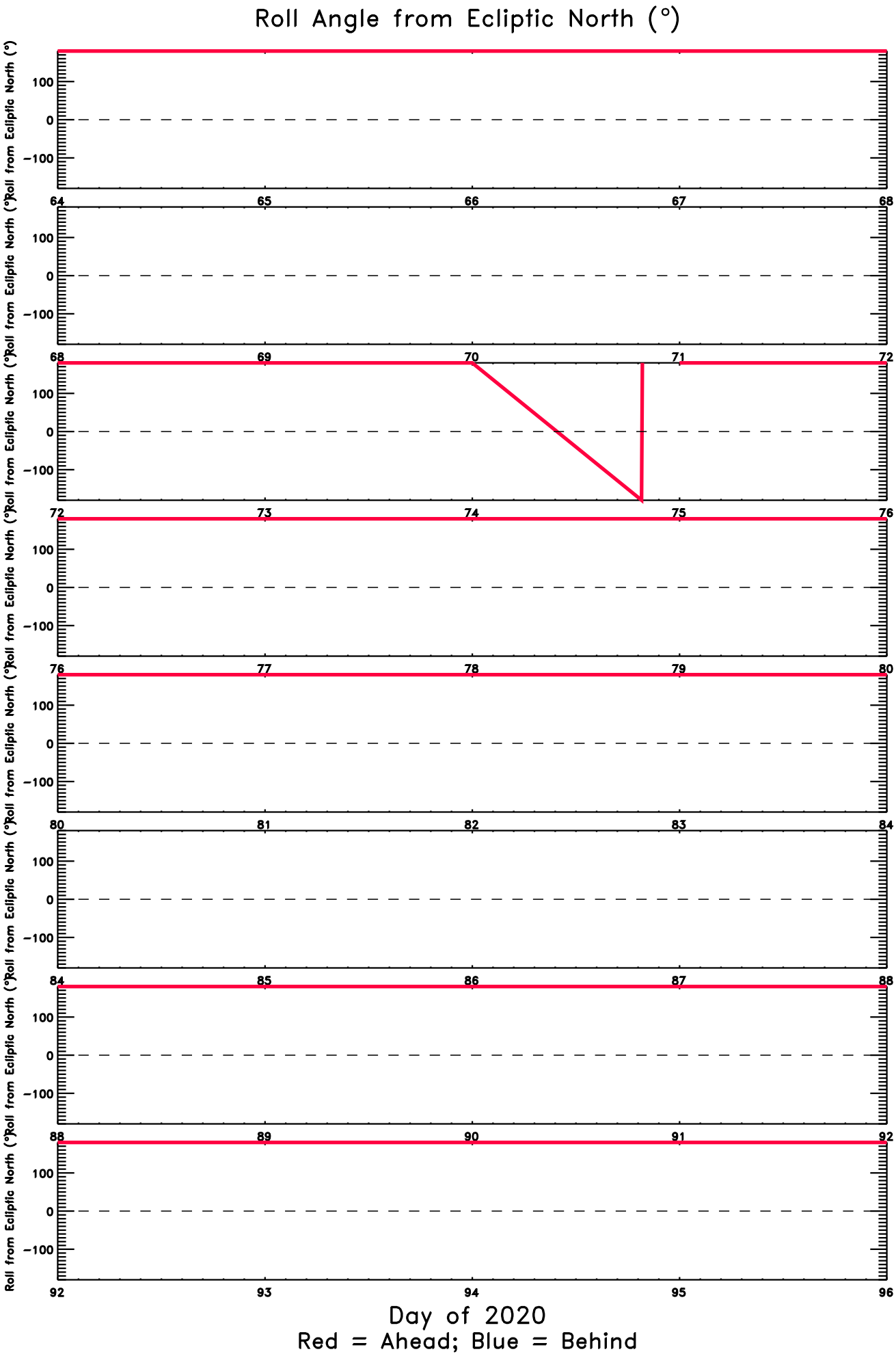
Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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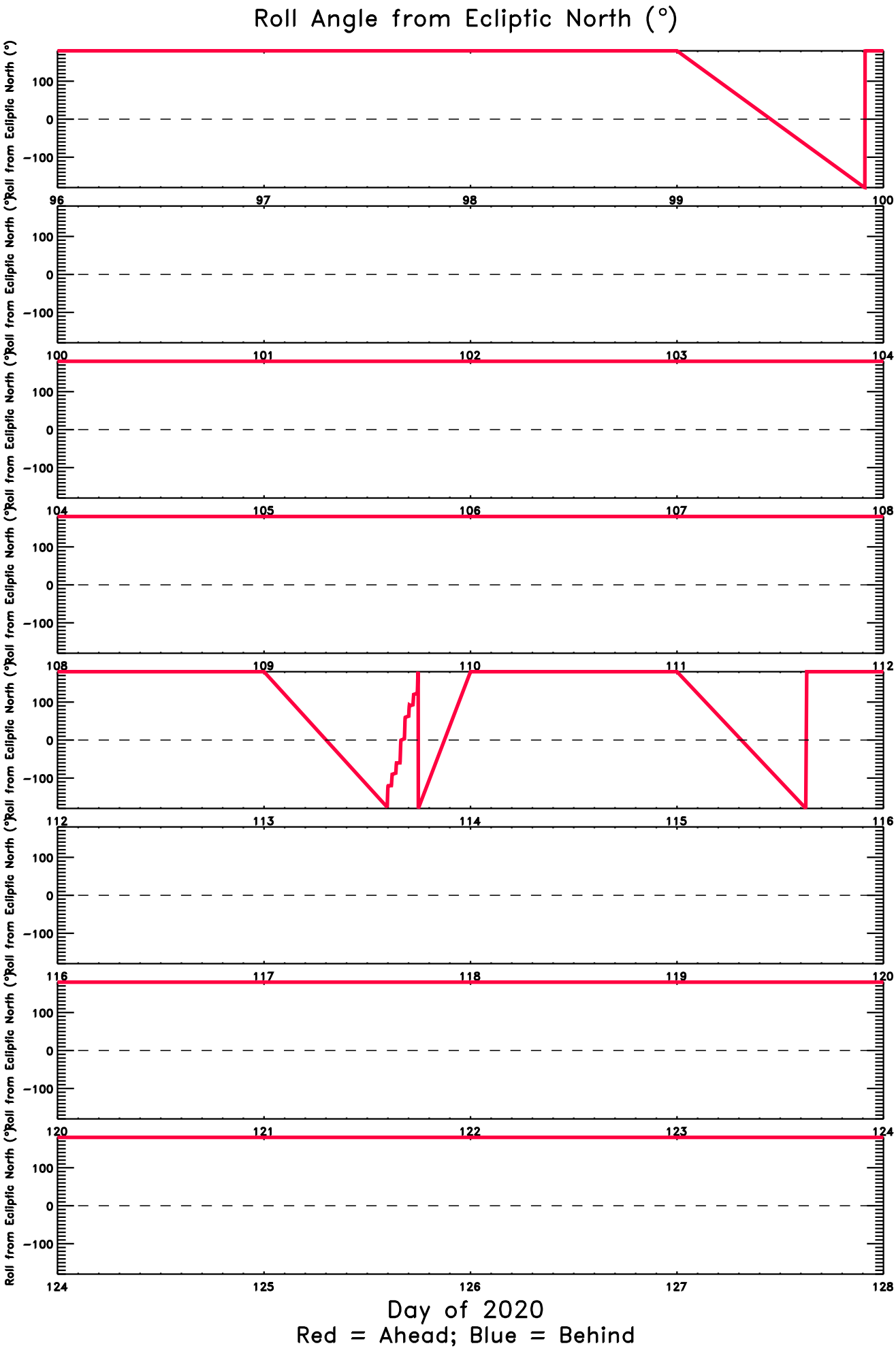
Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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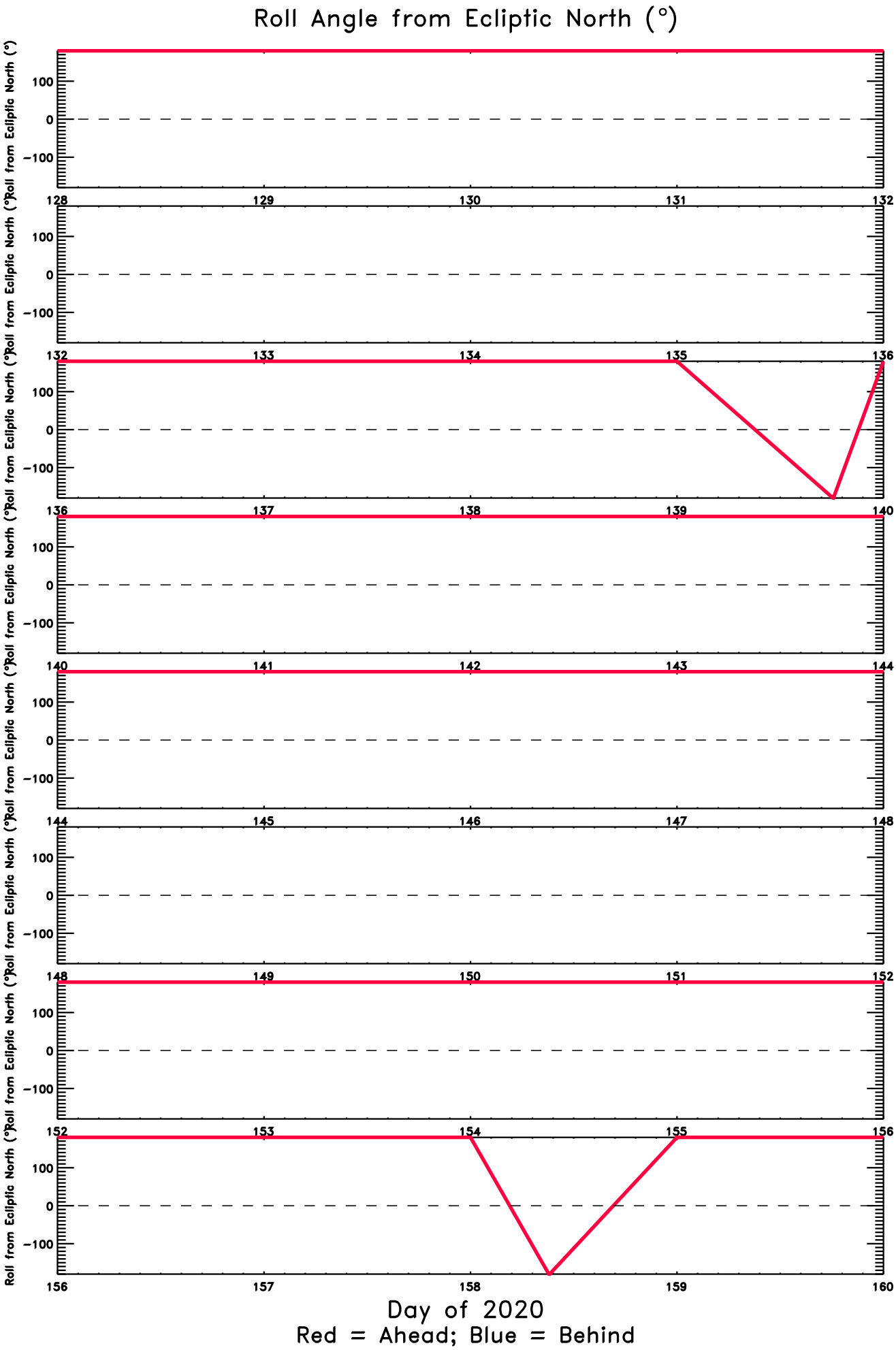
Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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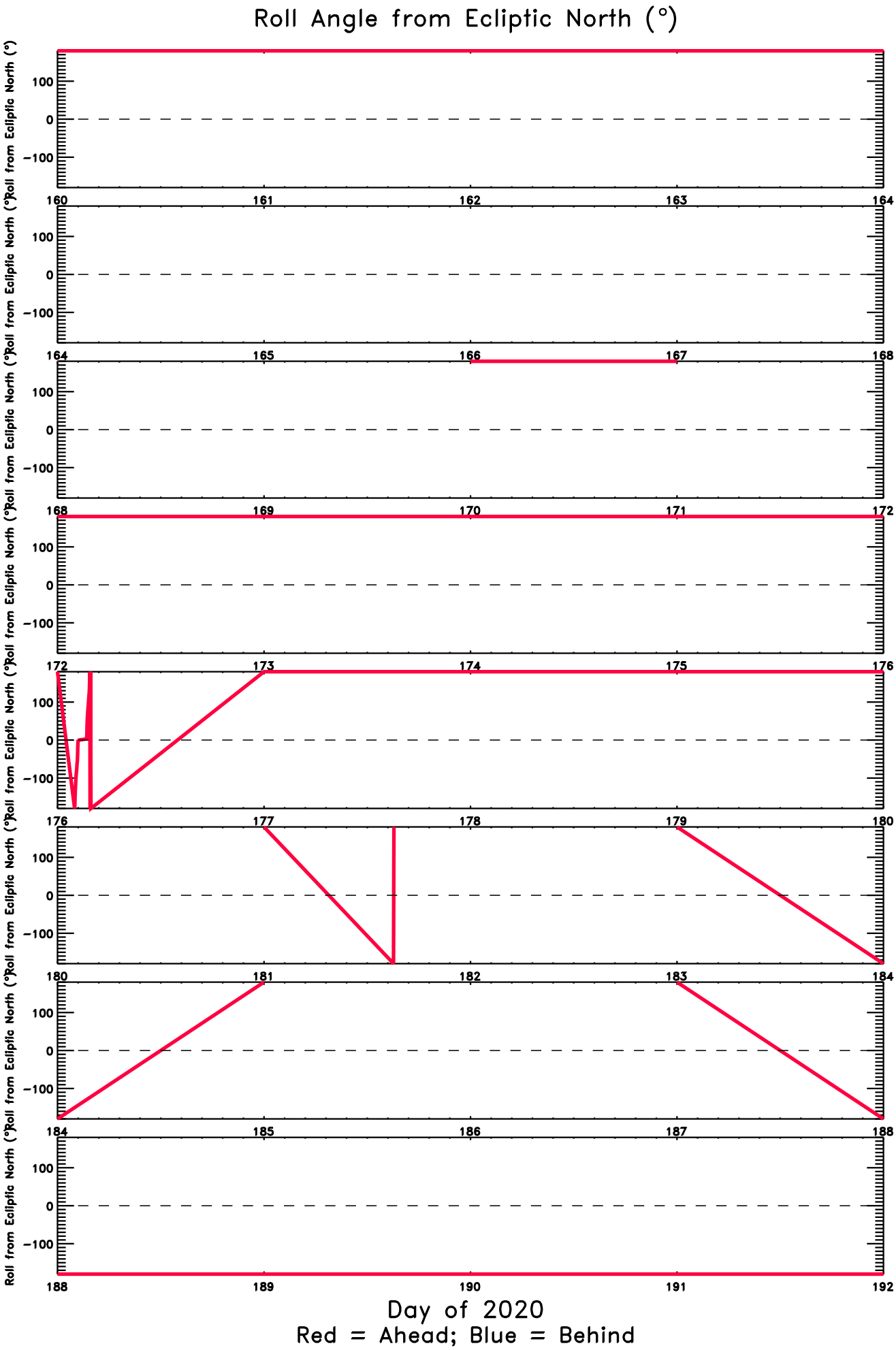
Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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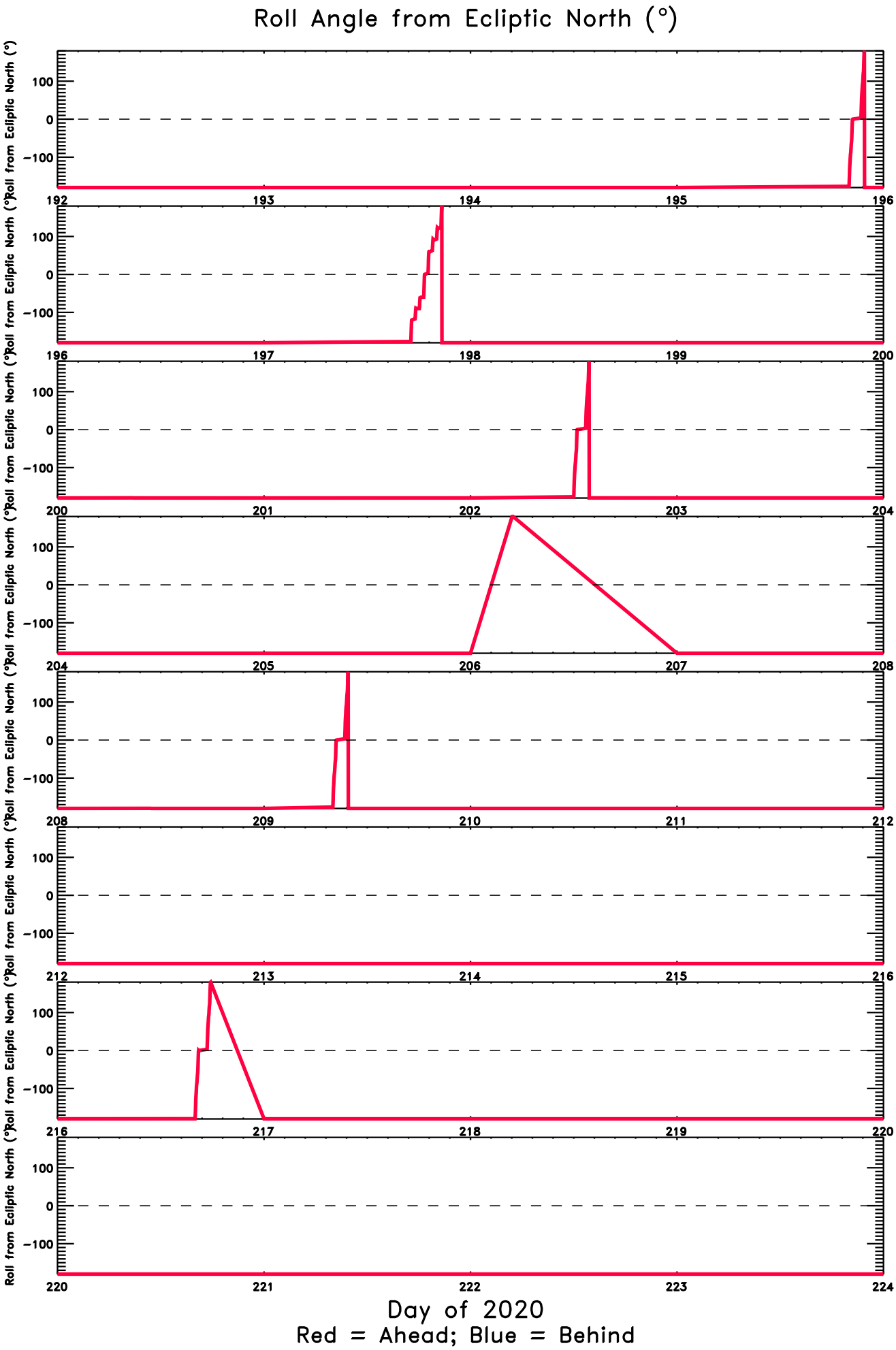
Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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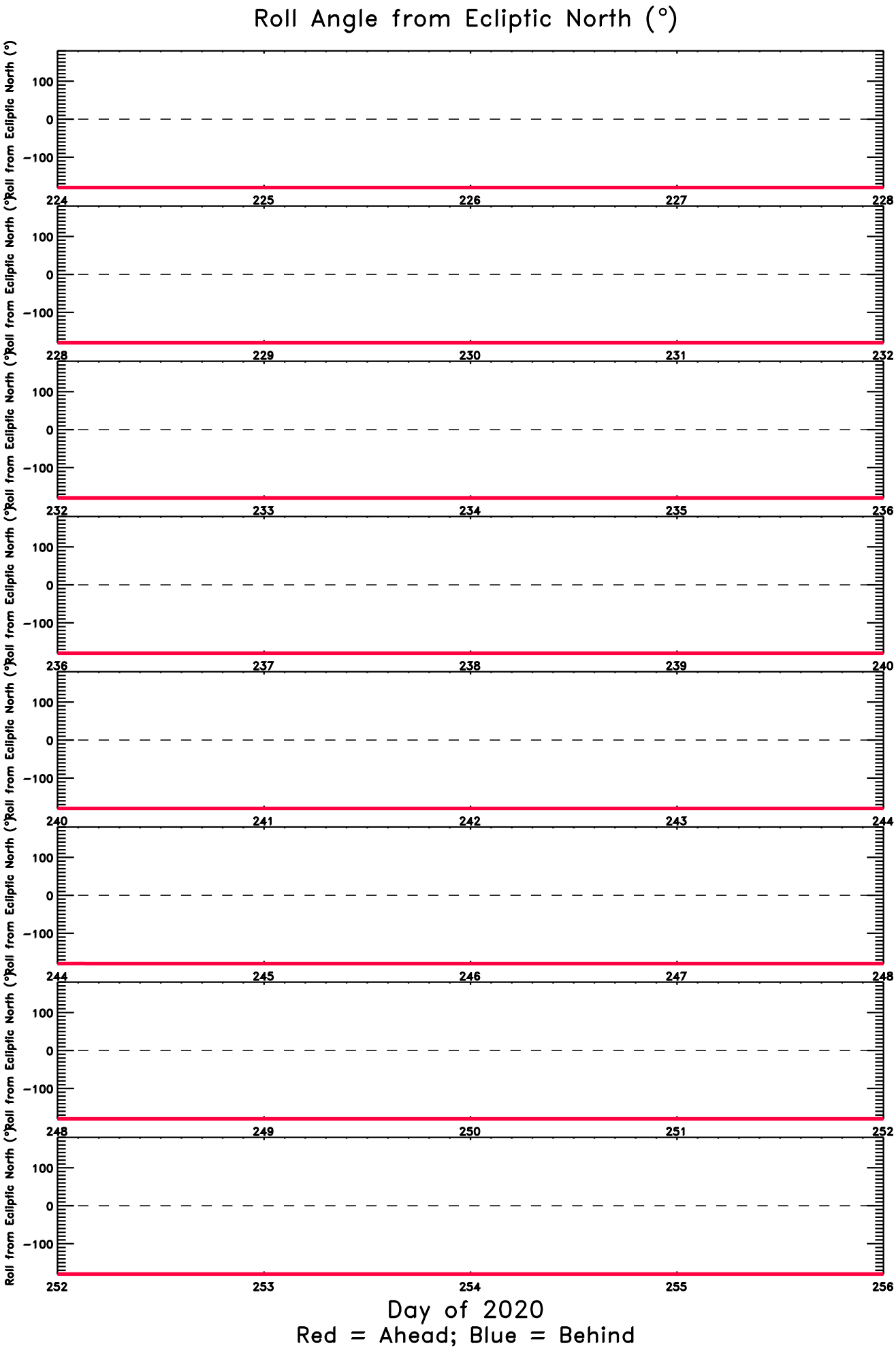
Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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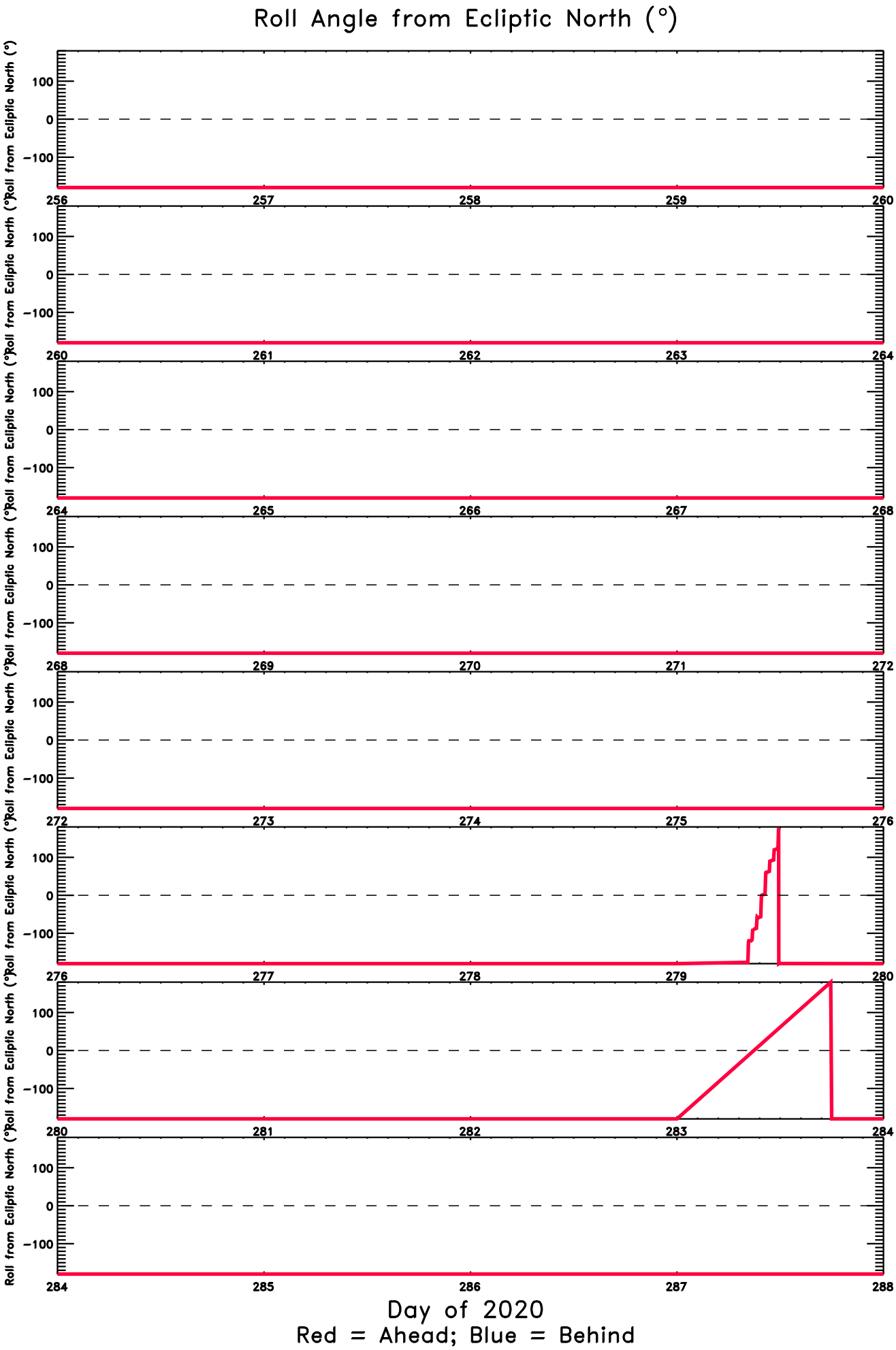
Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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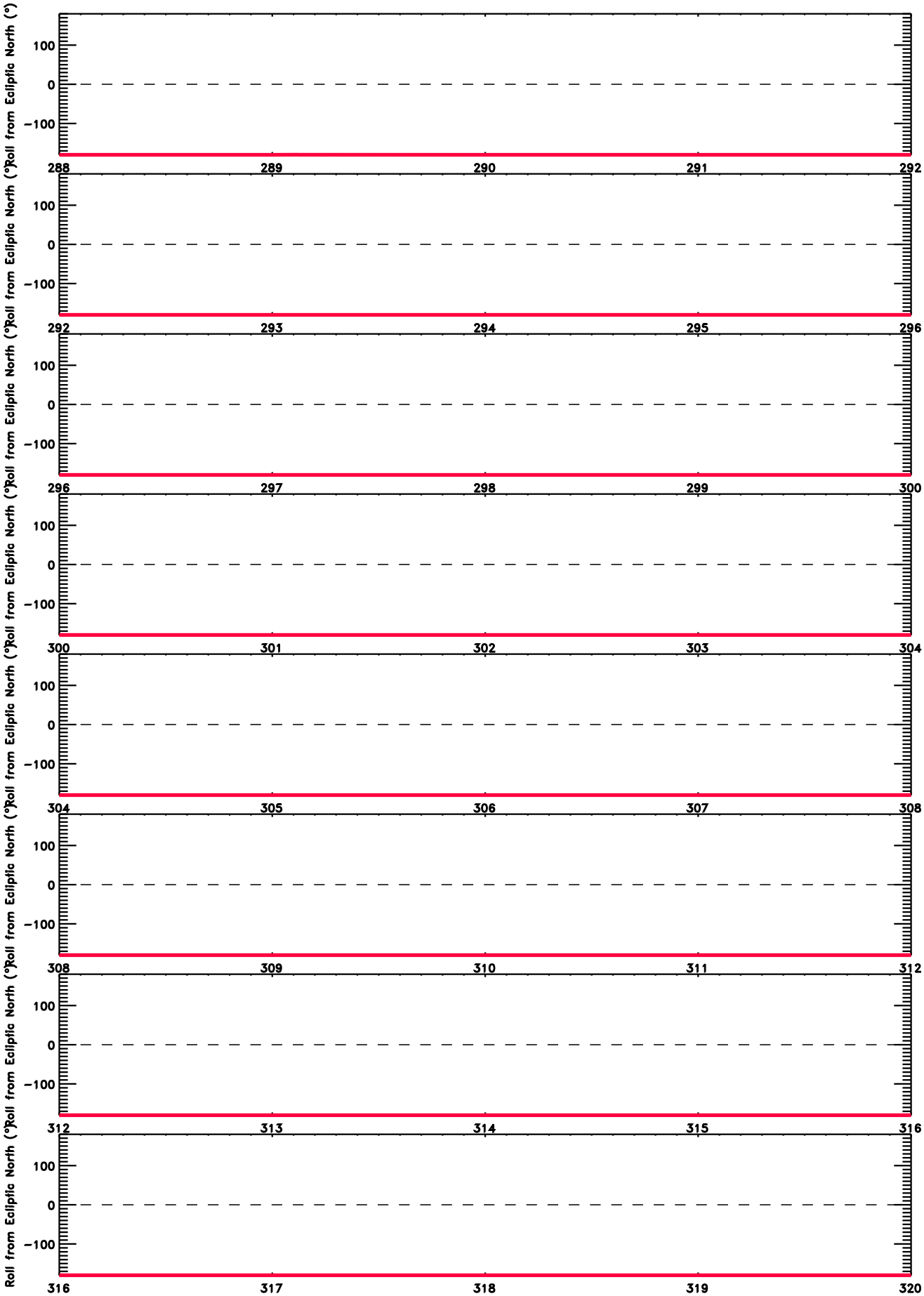
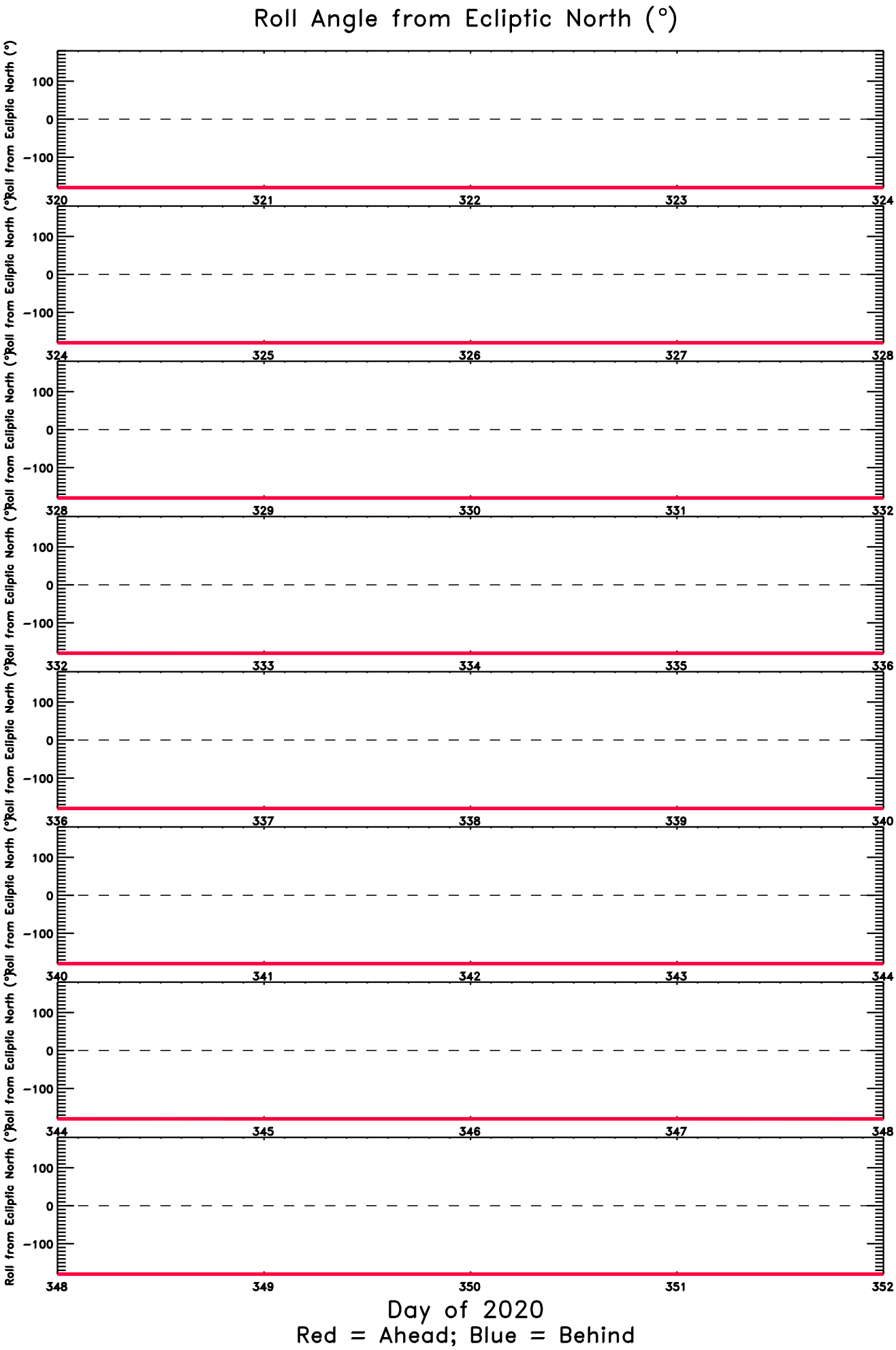
Day of 2020
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2020

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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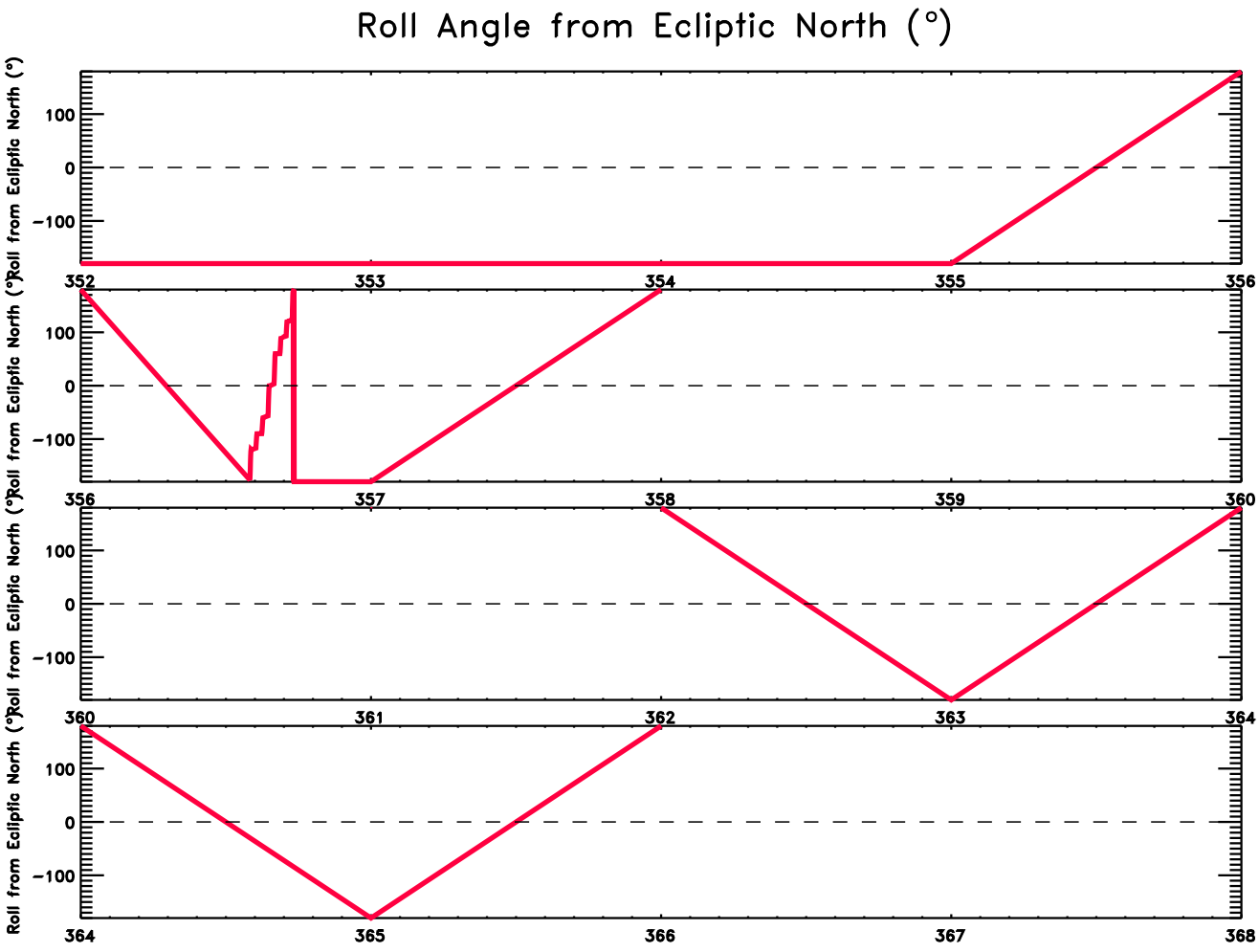
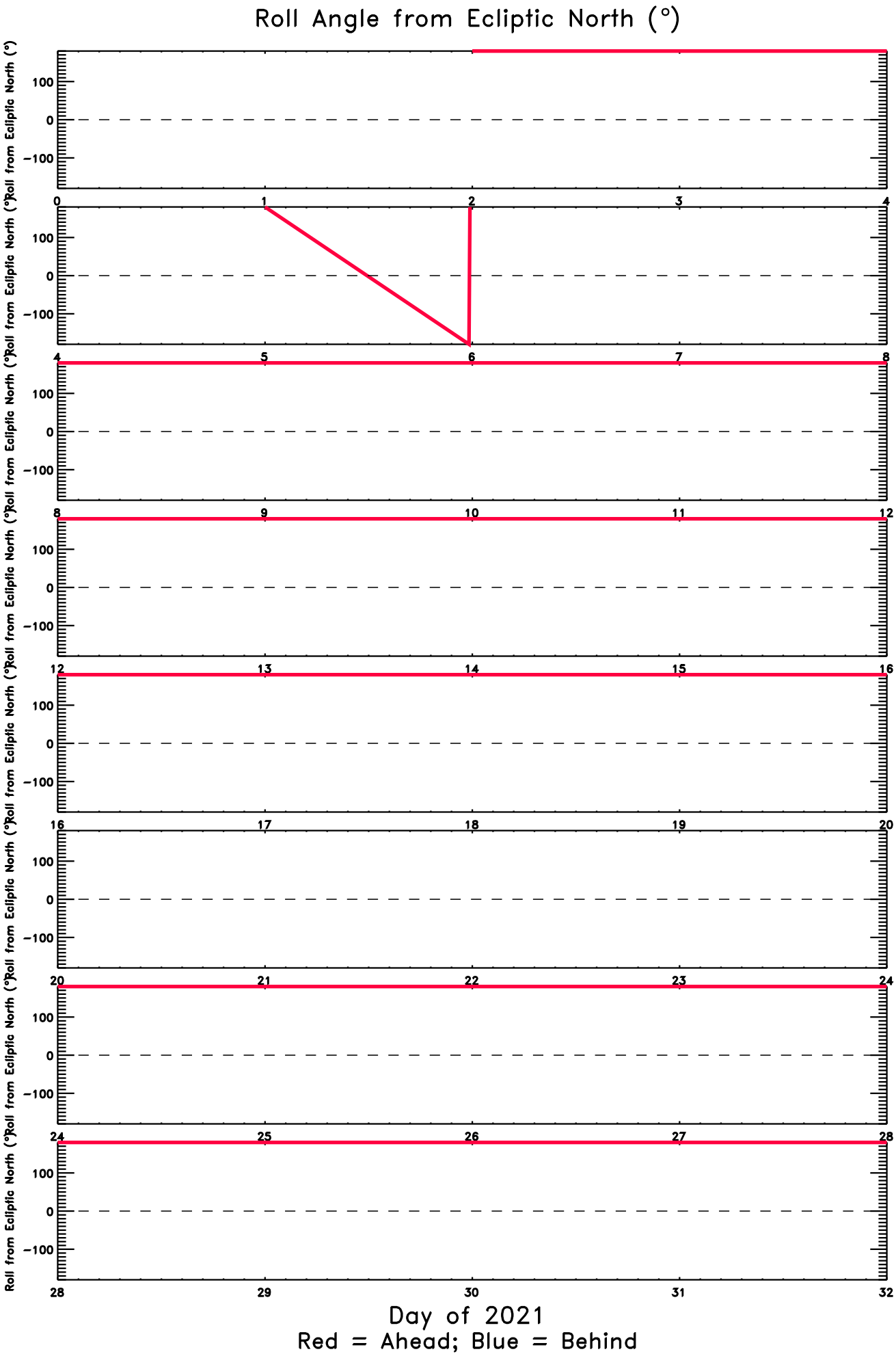
Day of 2020
Red = Ahead; Blue = Behind



Day of 2020
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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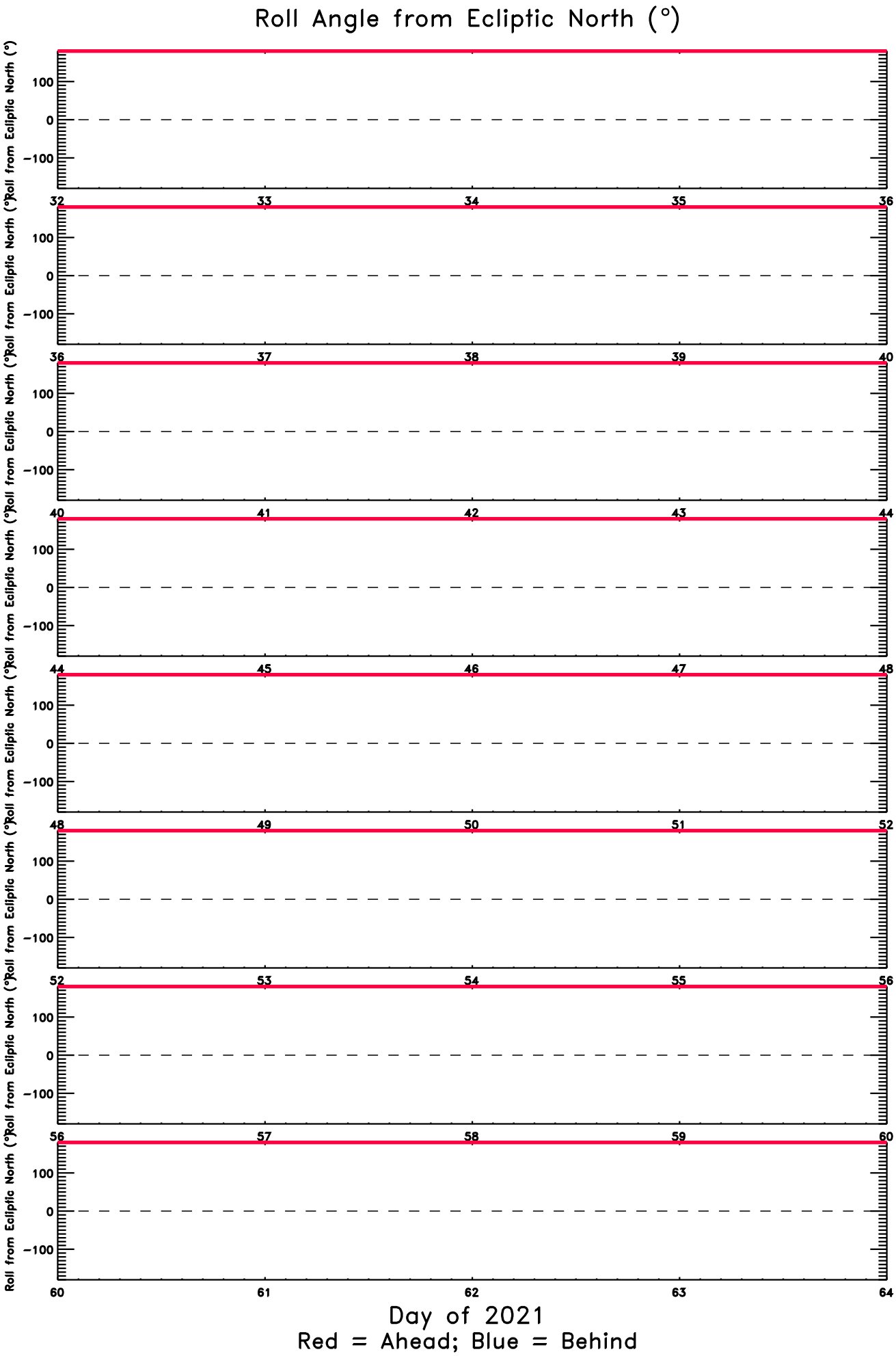
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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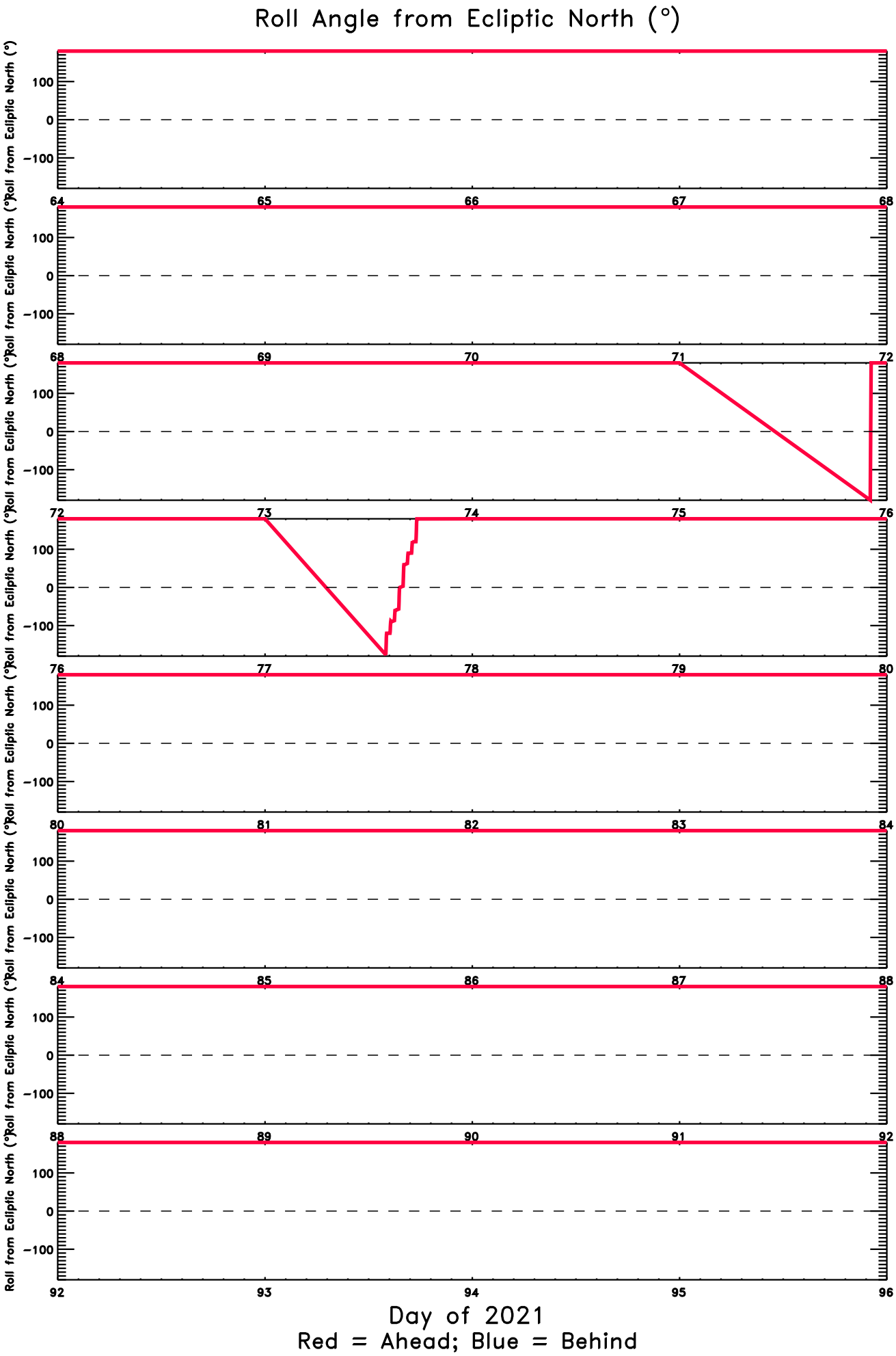
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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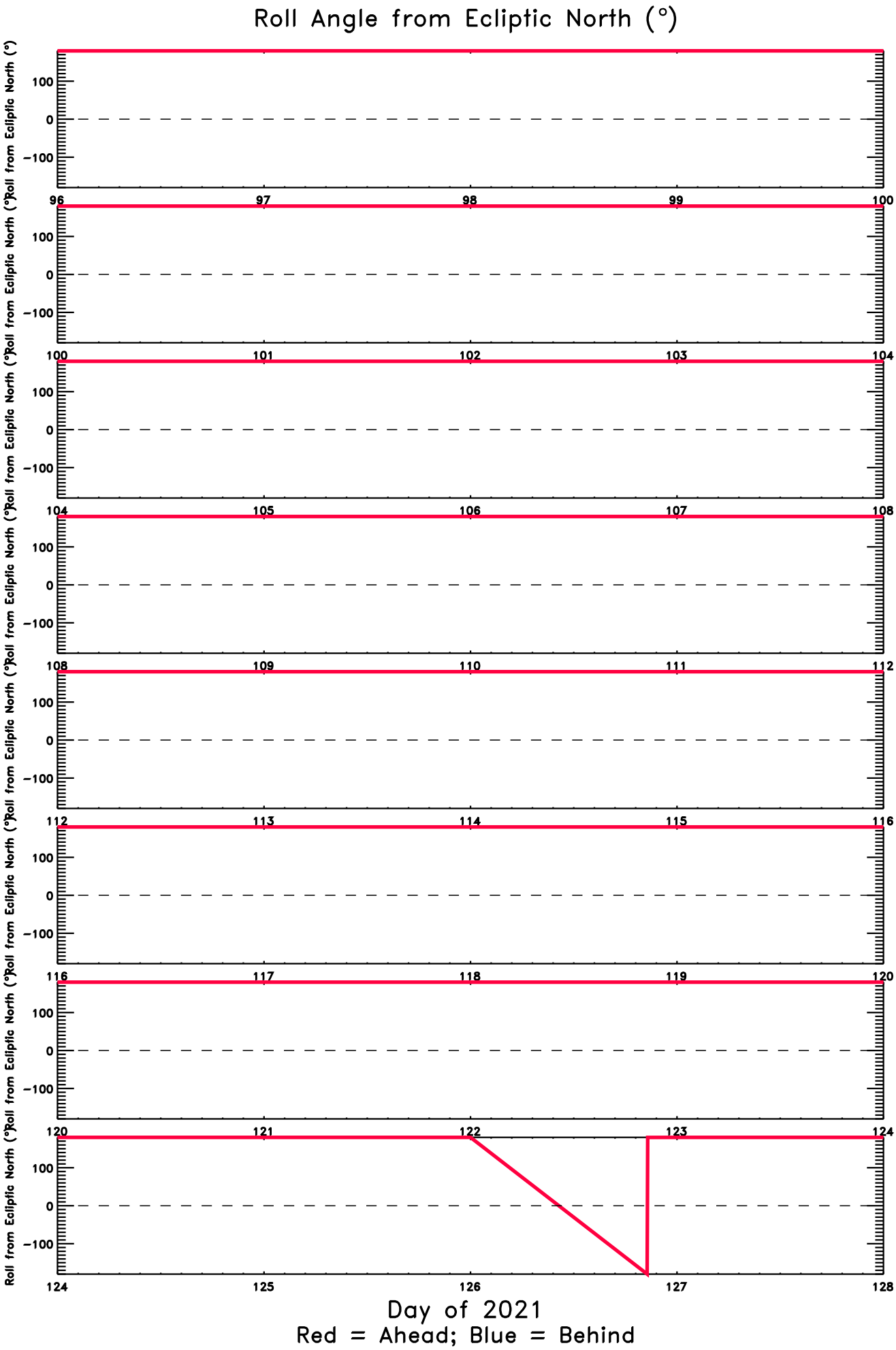
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
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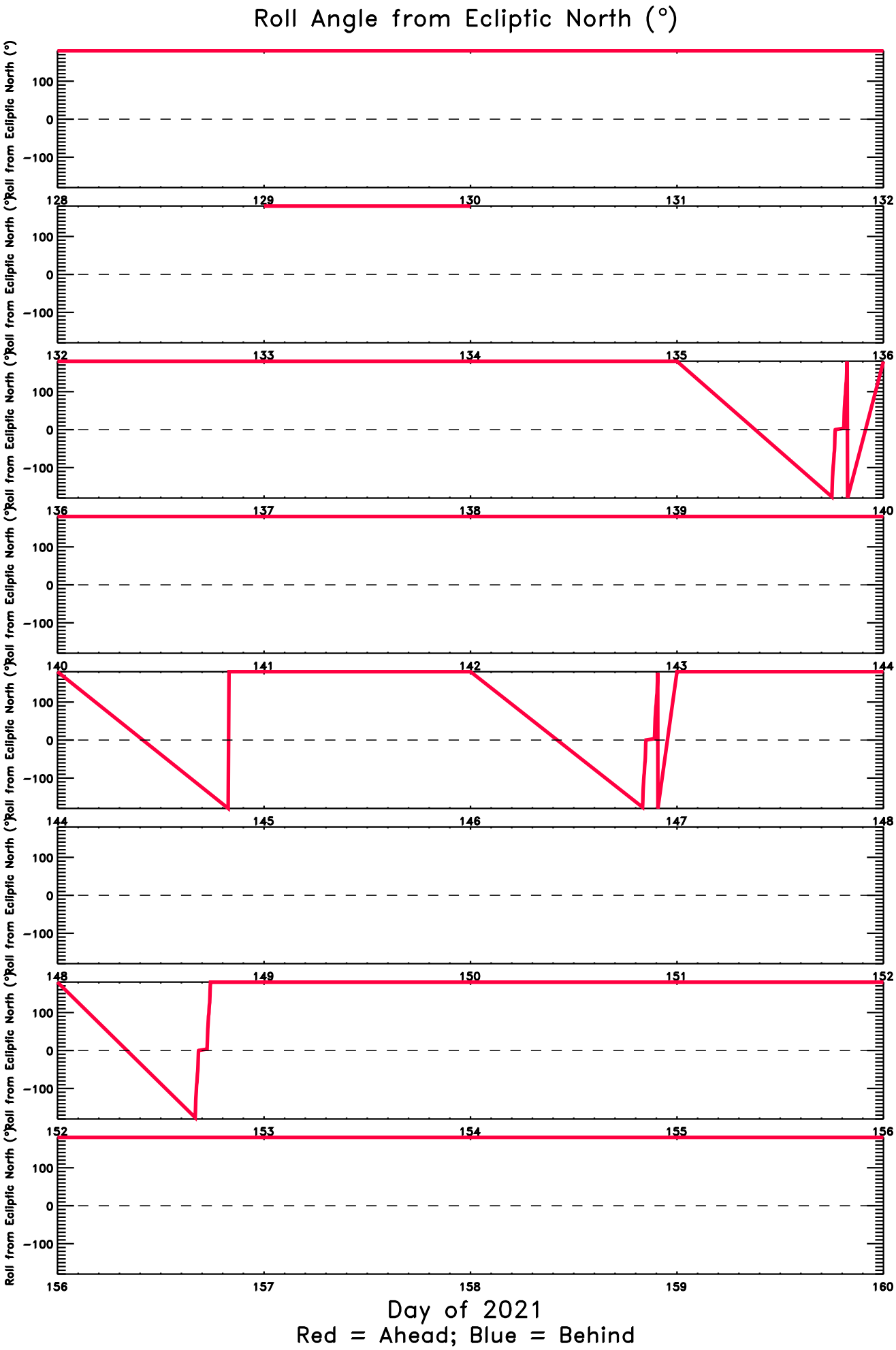
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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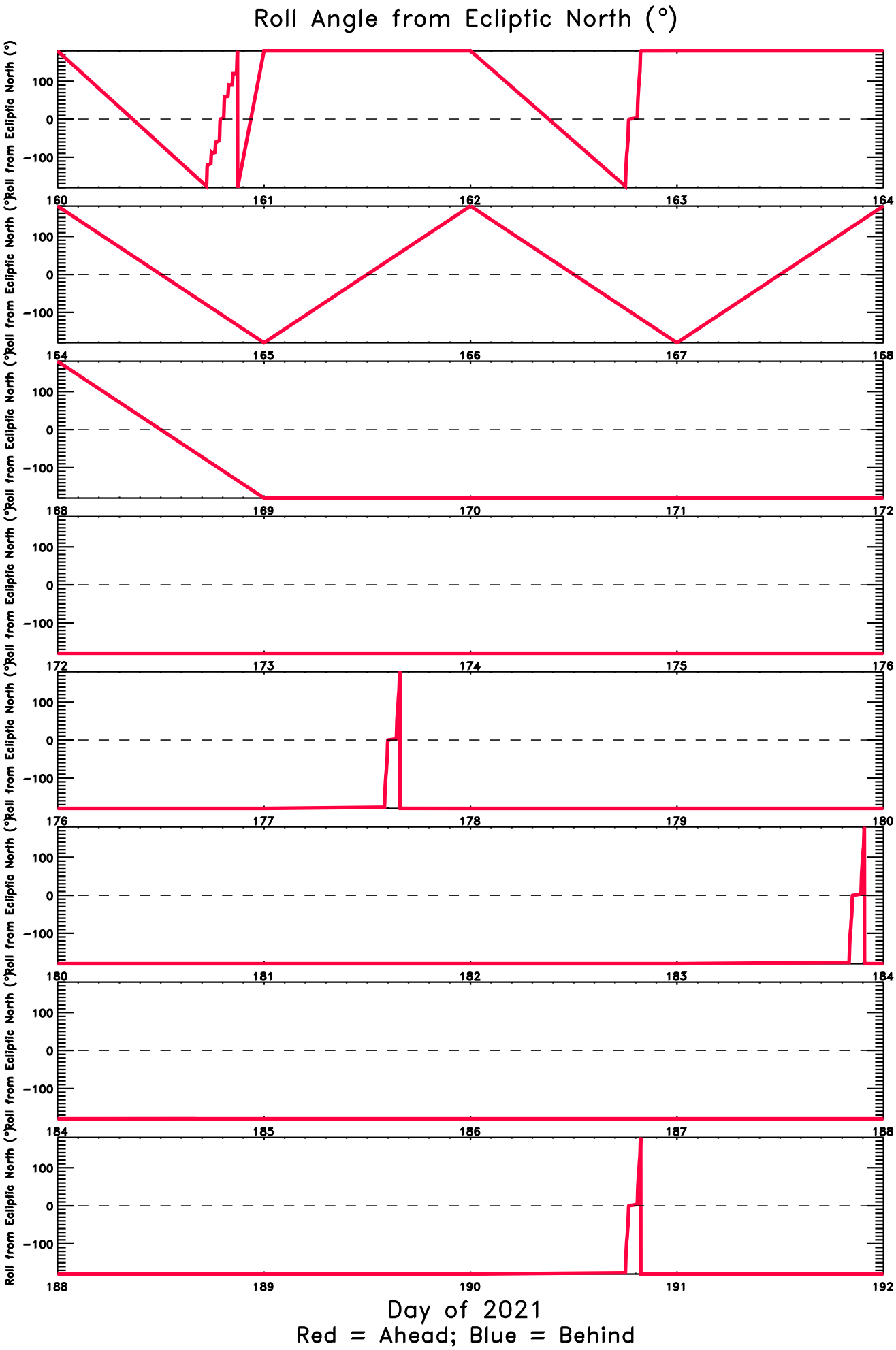
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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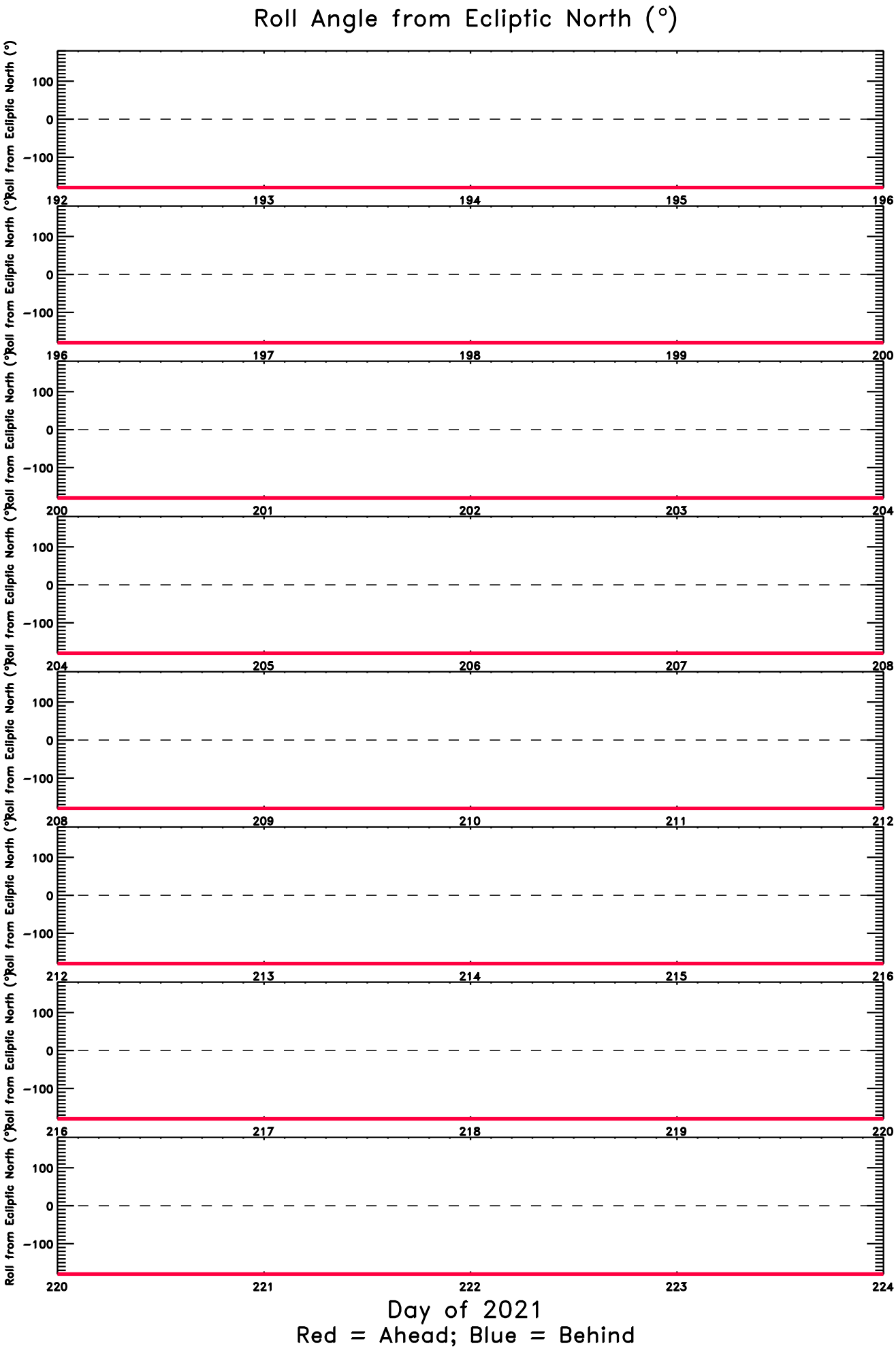
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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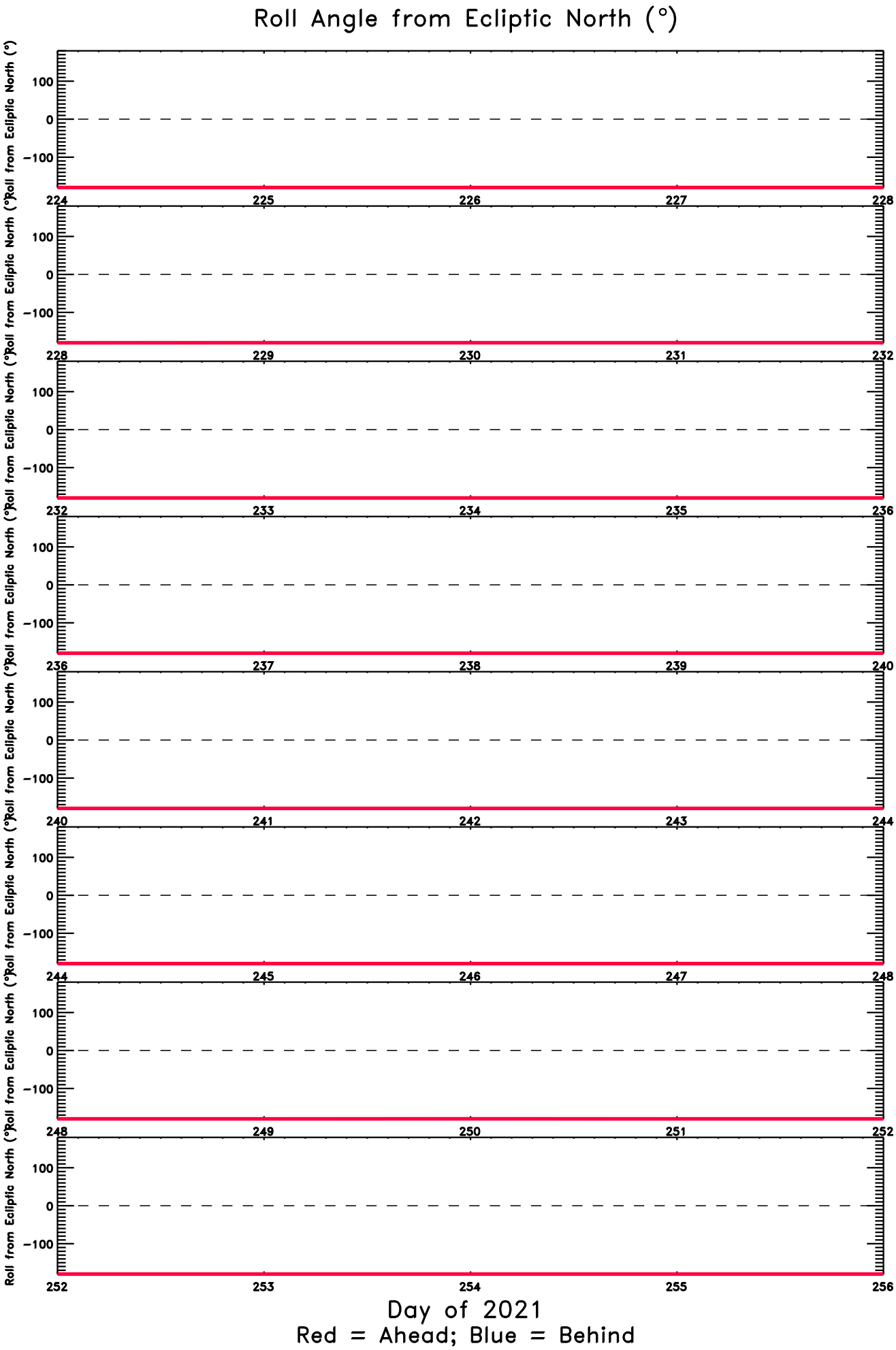
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
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−100
224
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227
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240
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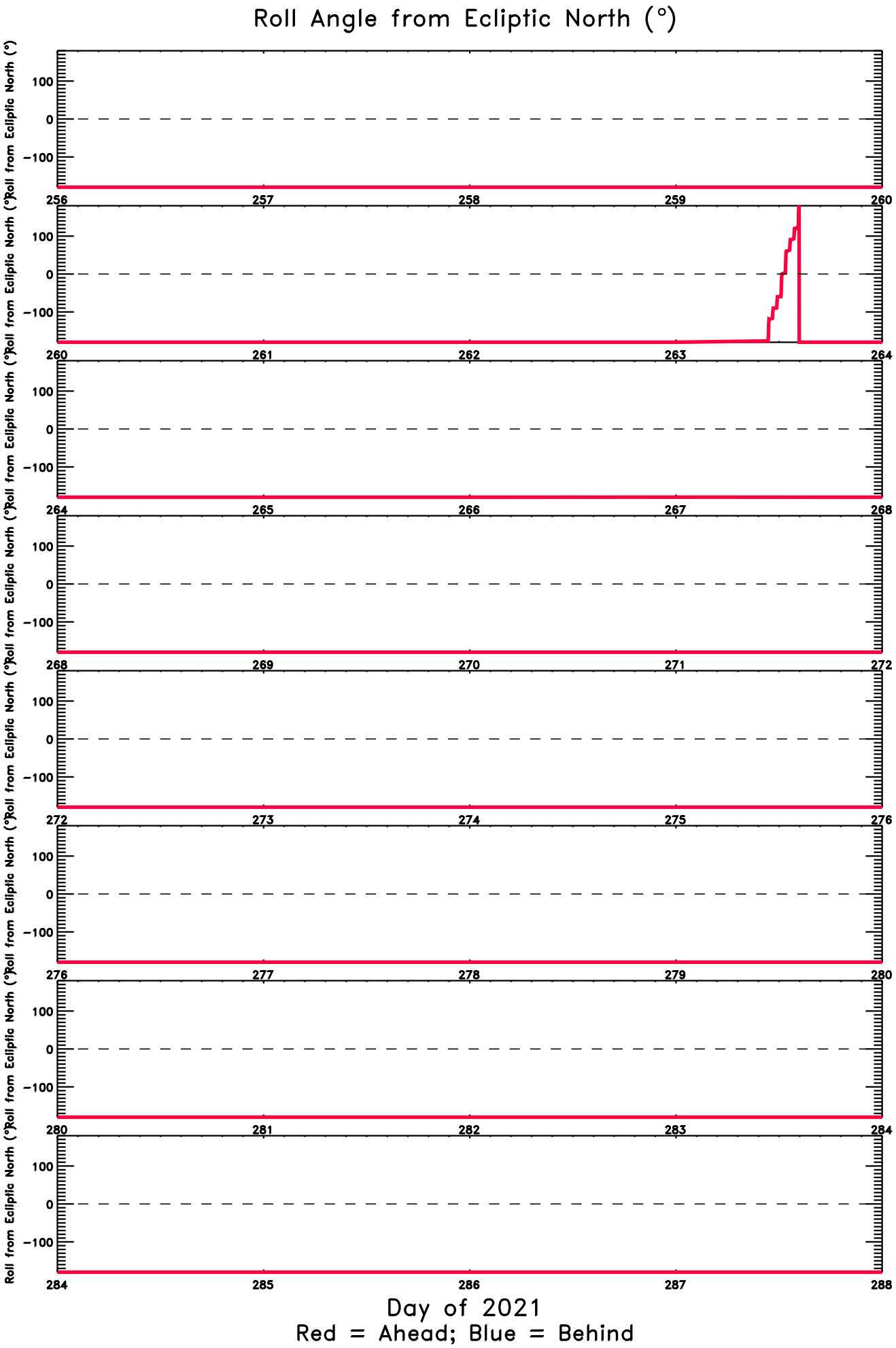
254
255
256
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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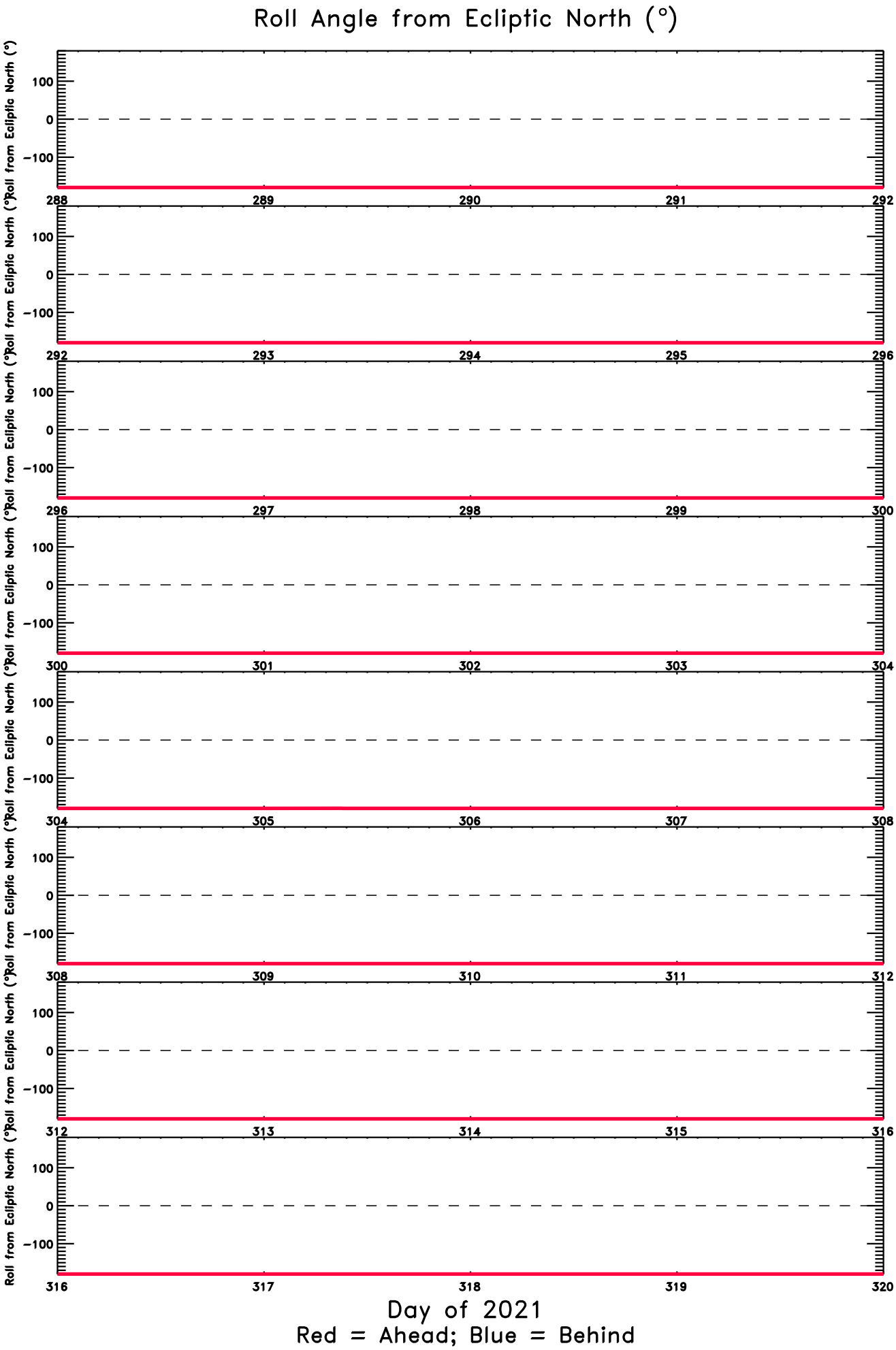
288
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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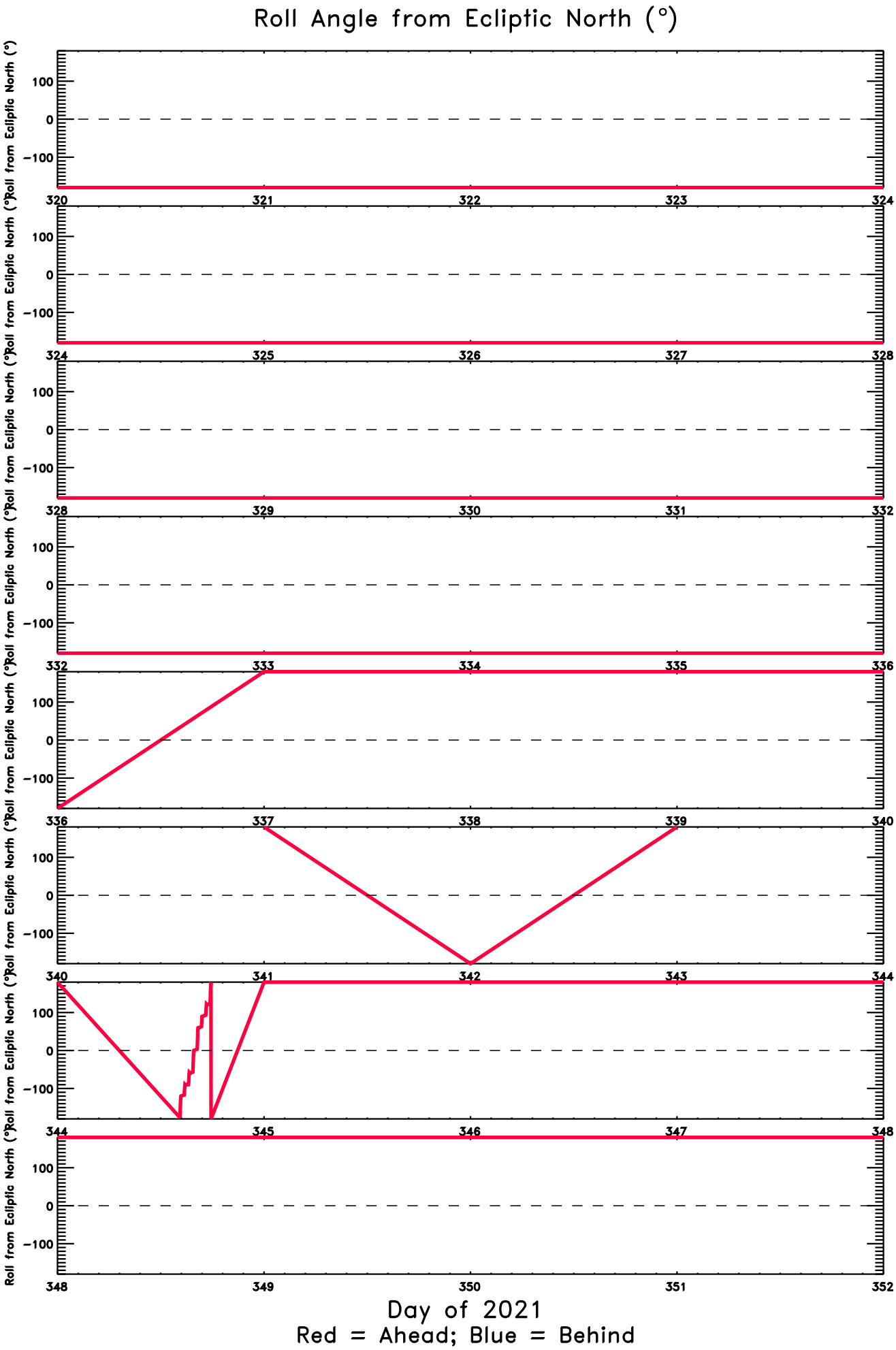
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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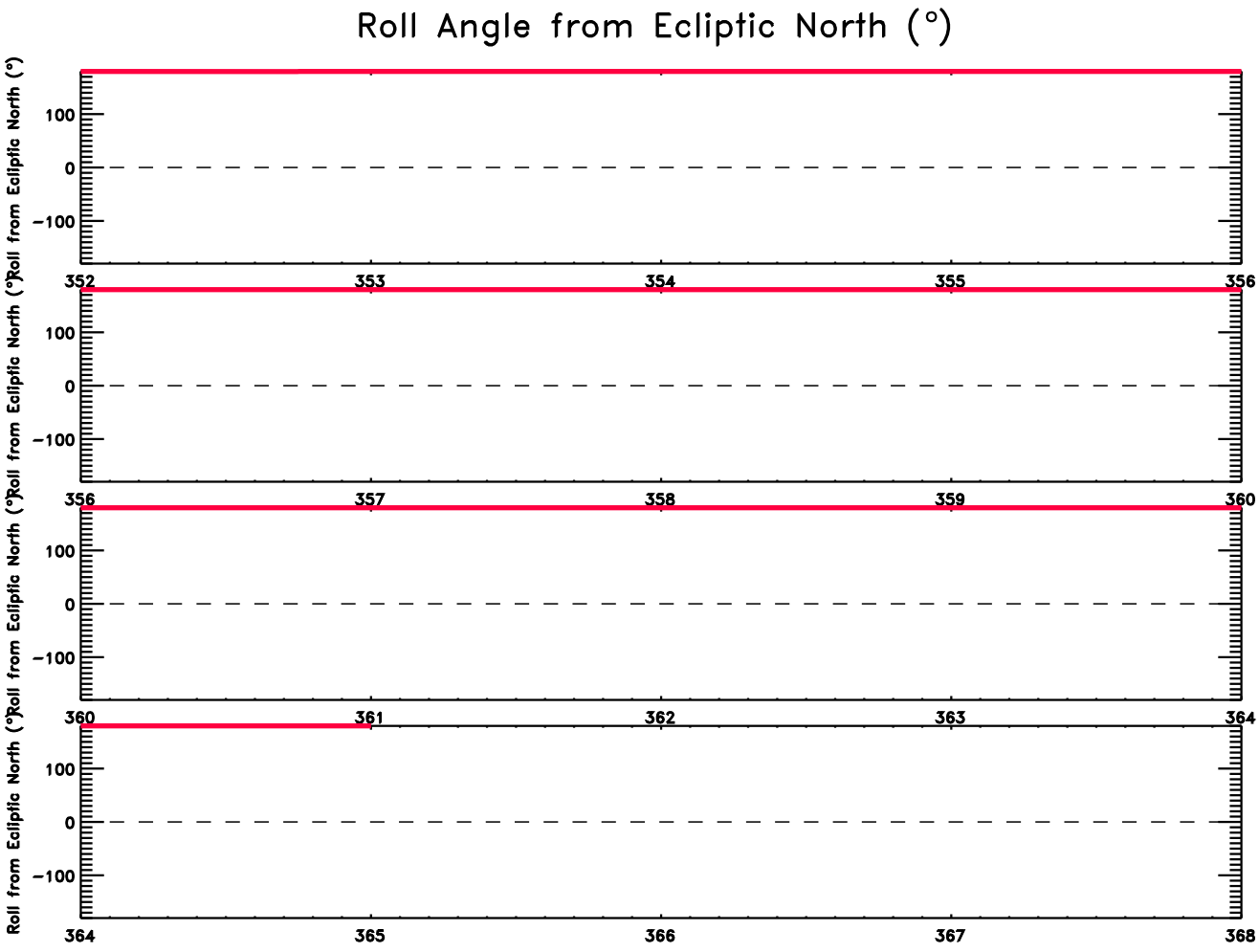
Day of 2021
Red = Ahead; Blue = Behind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Roll from Ecliptic North (°)
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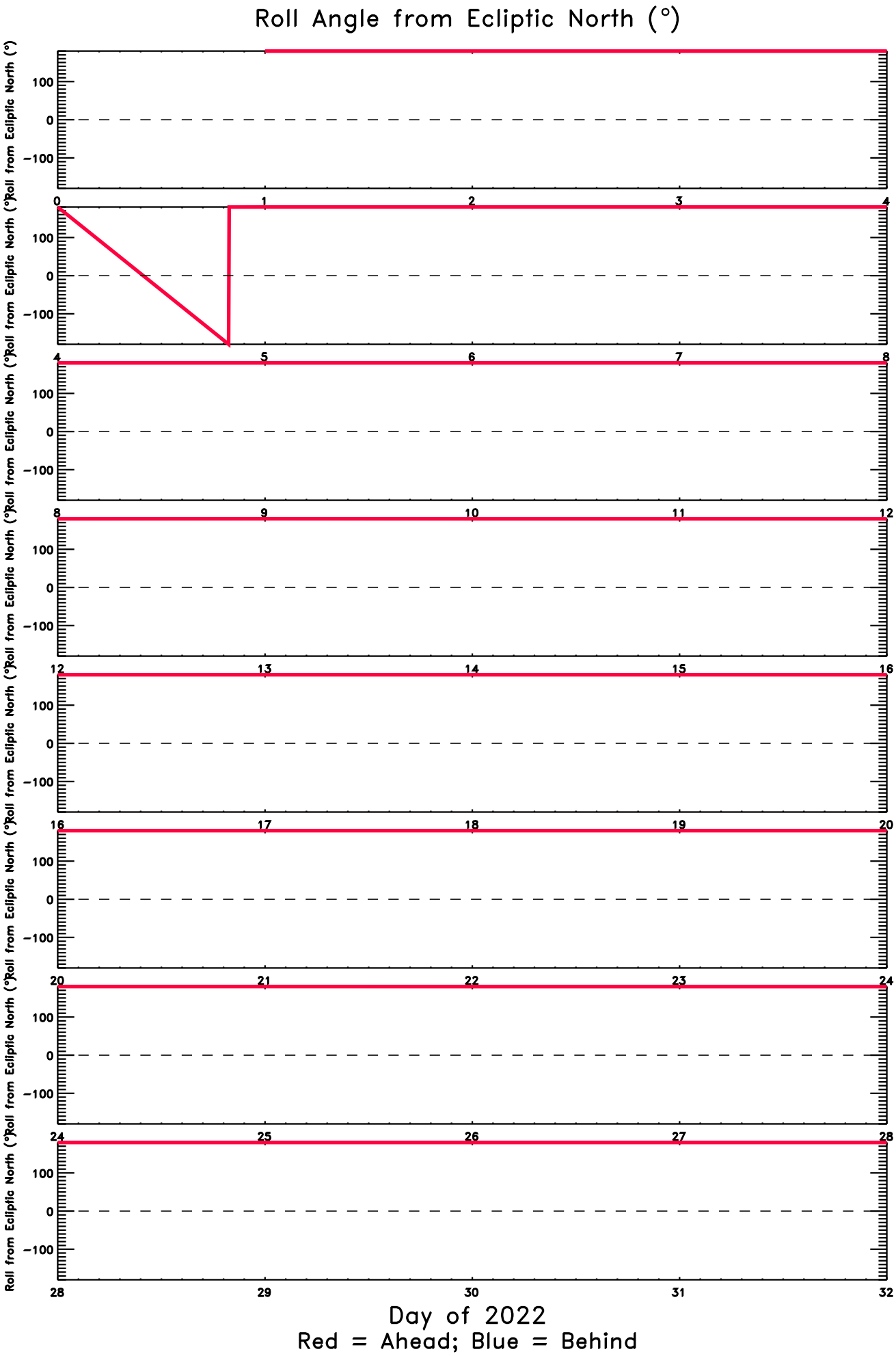
Day of 2021
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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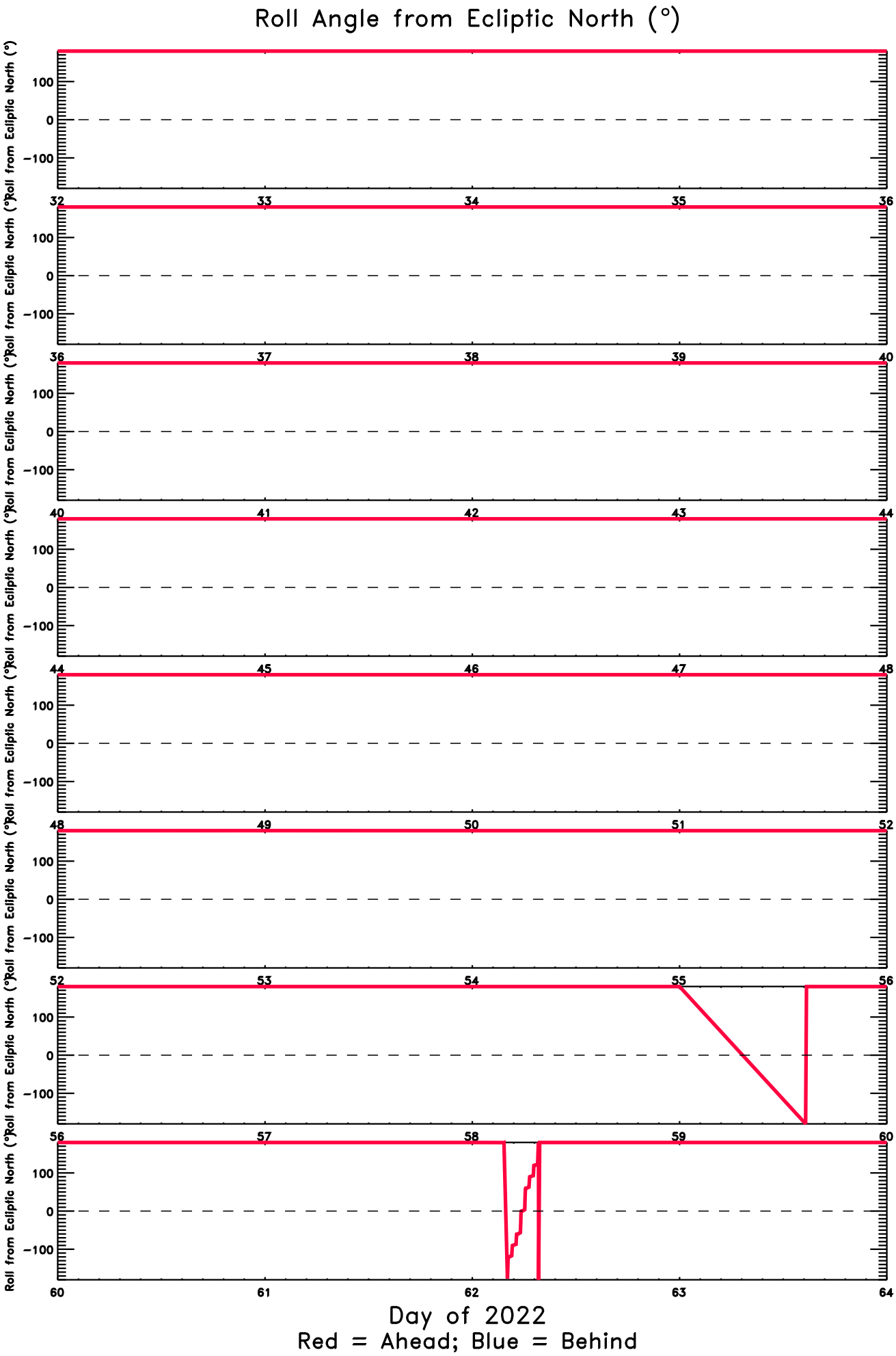
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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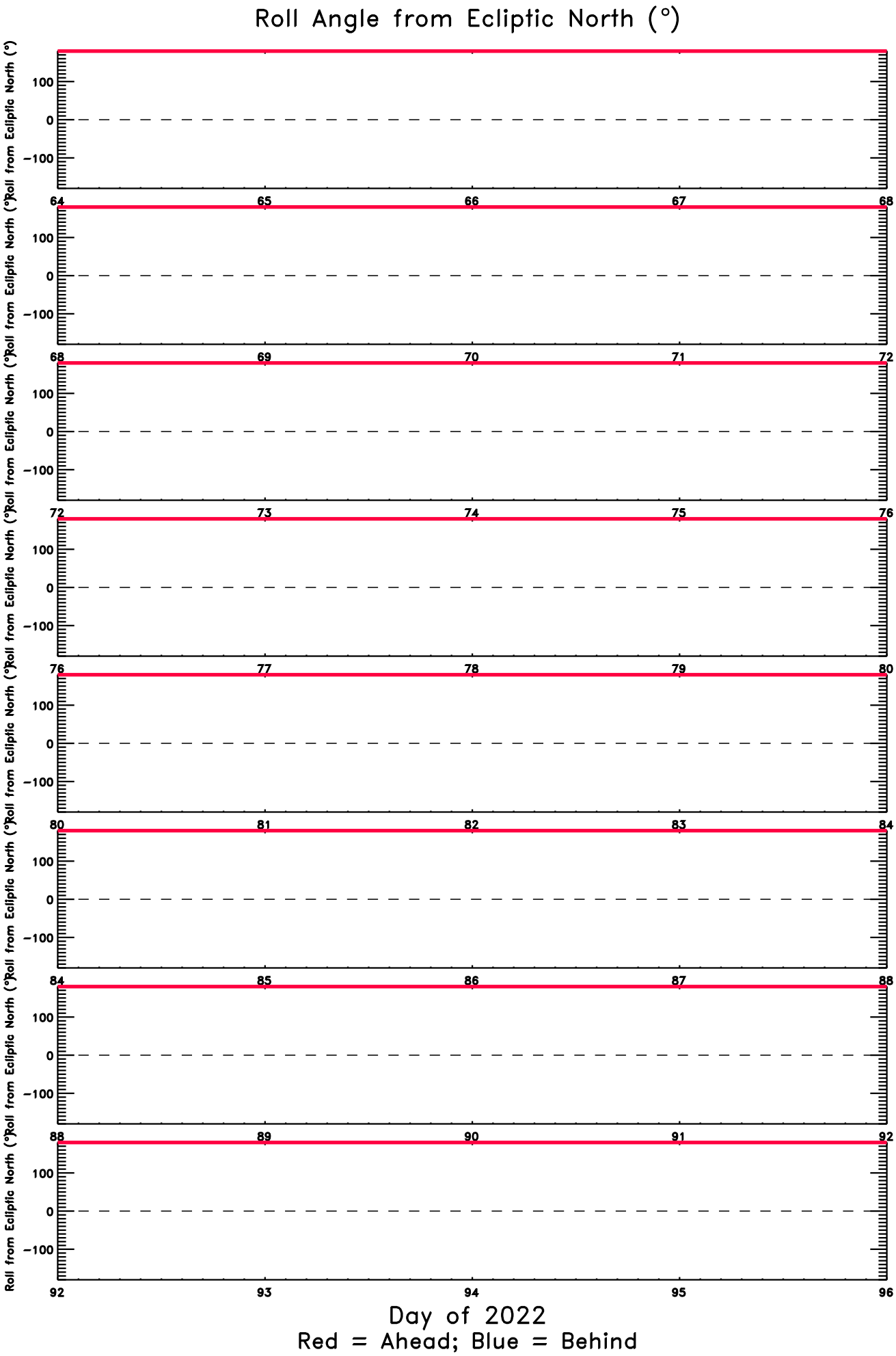
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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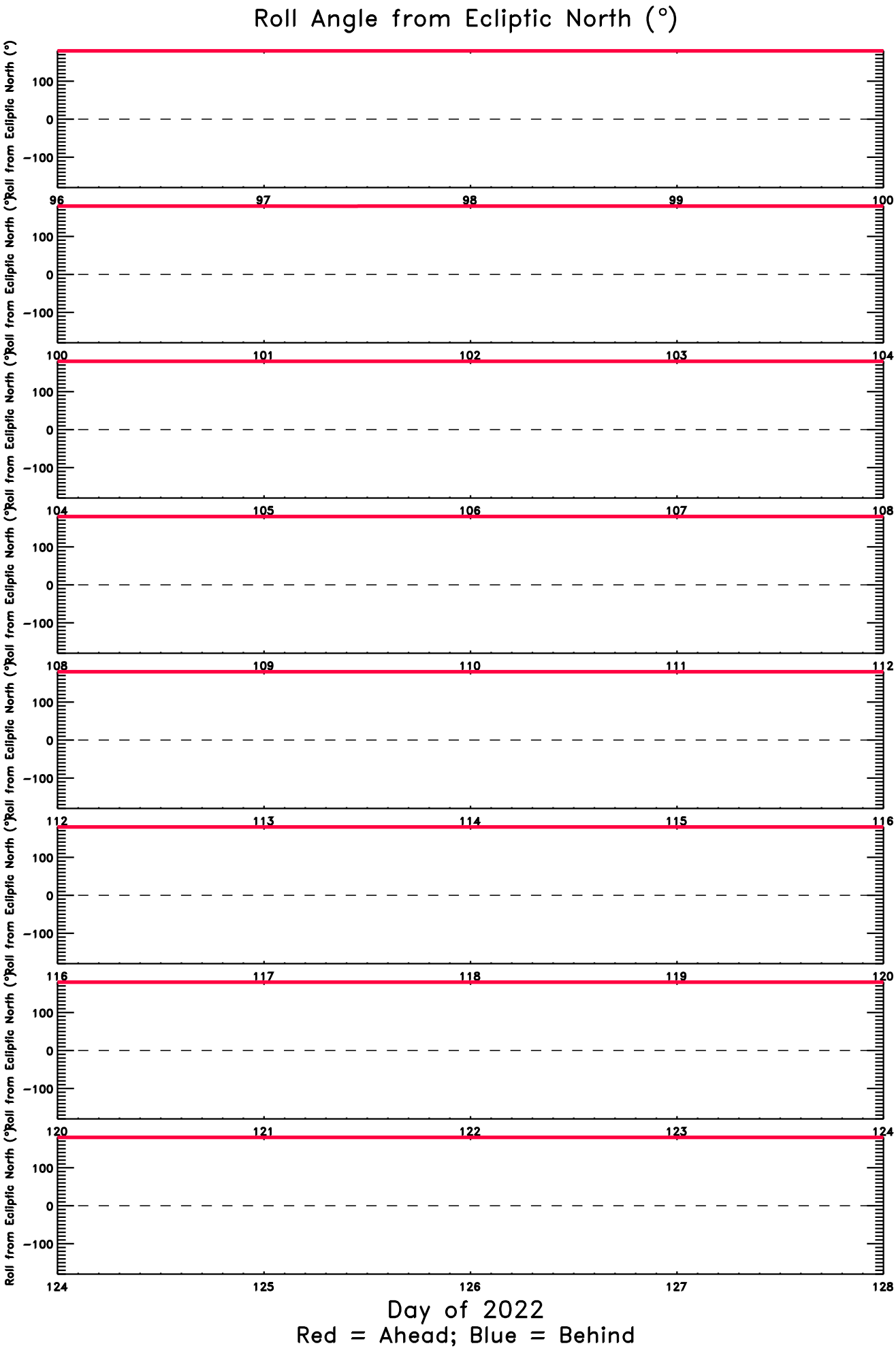
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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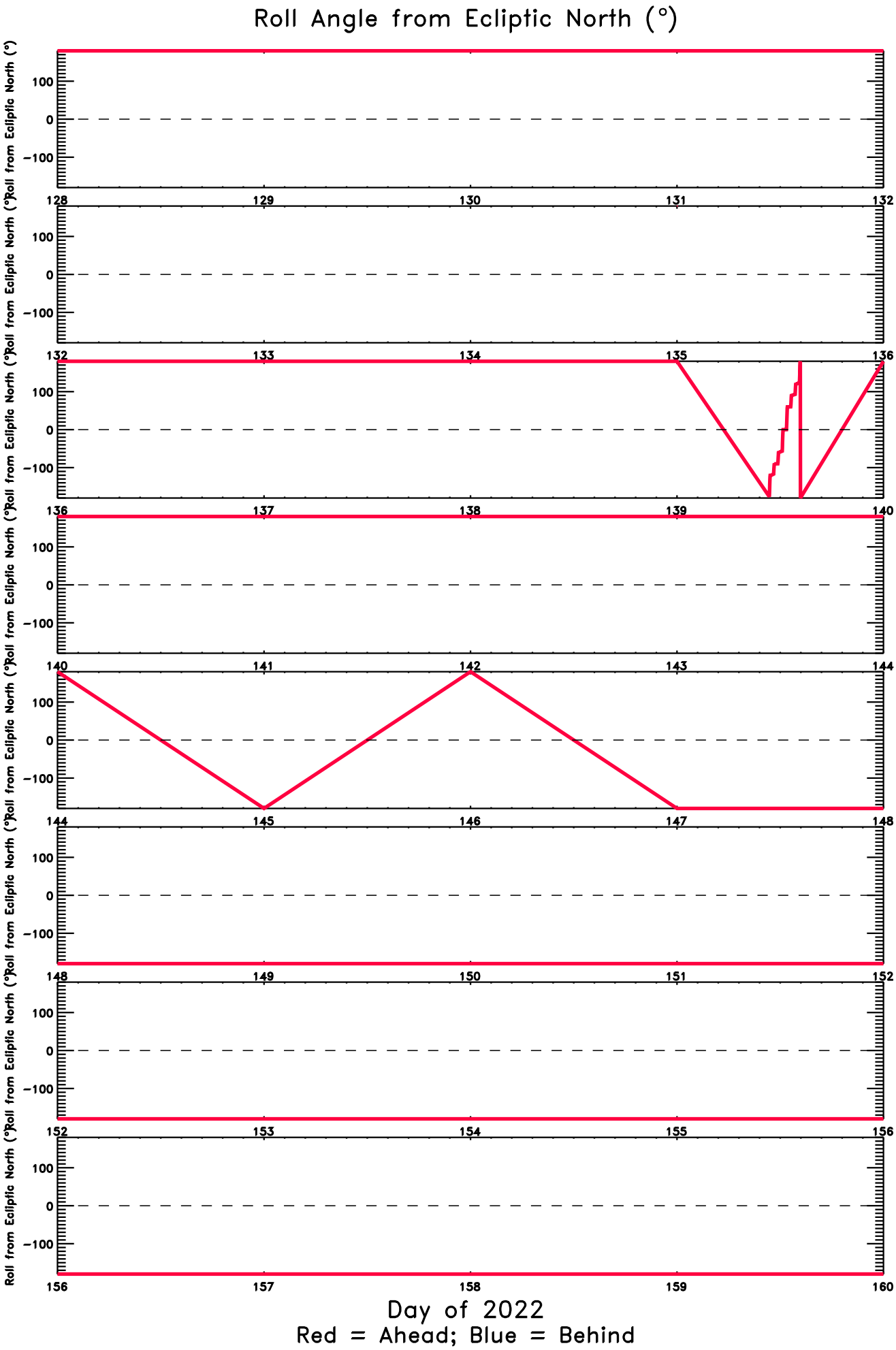
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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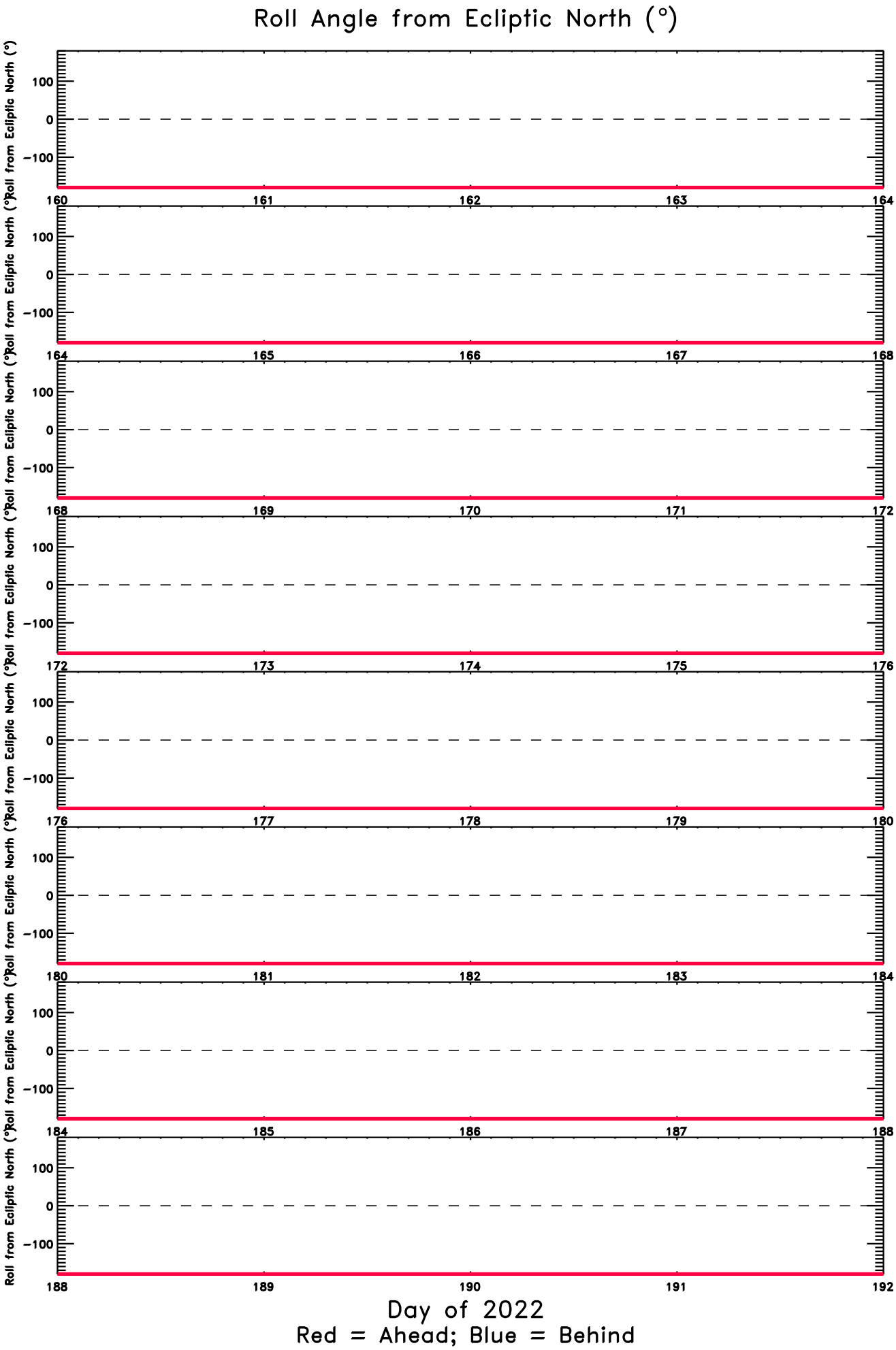
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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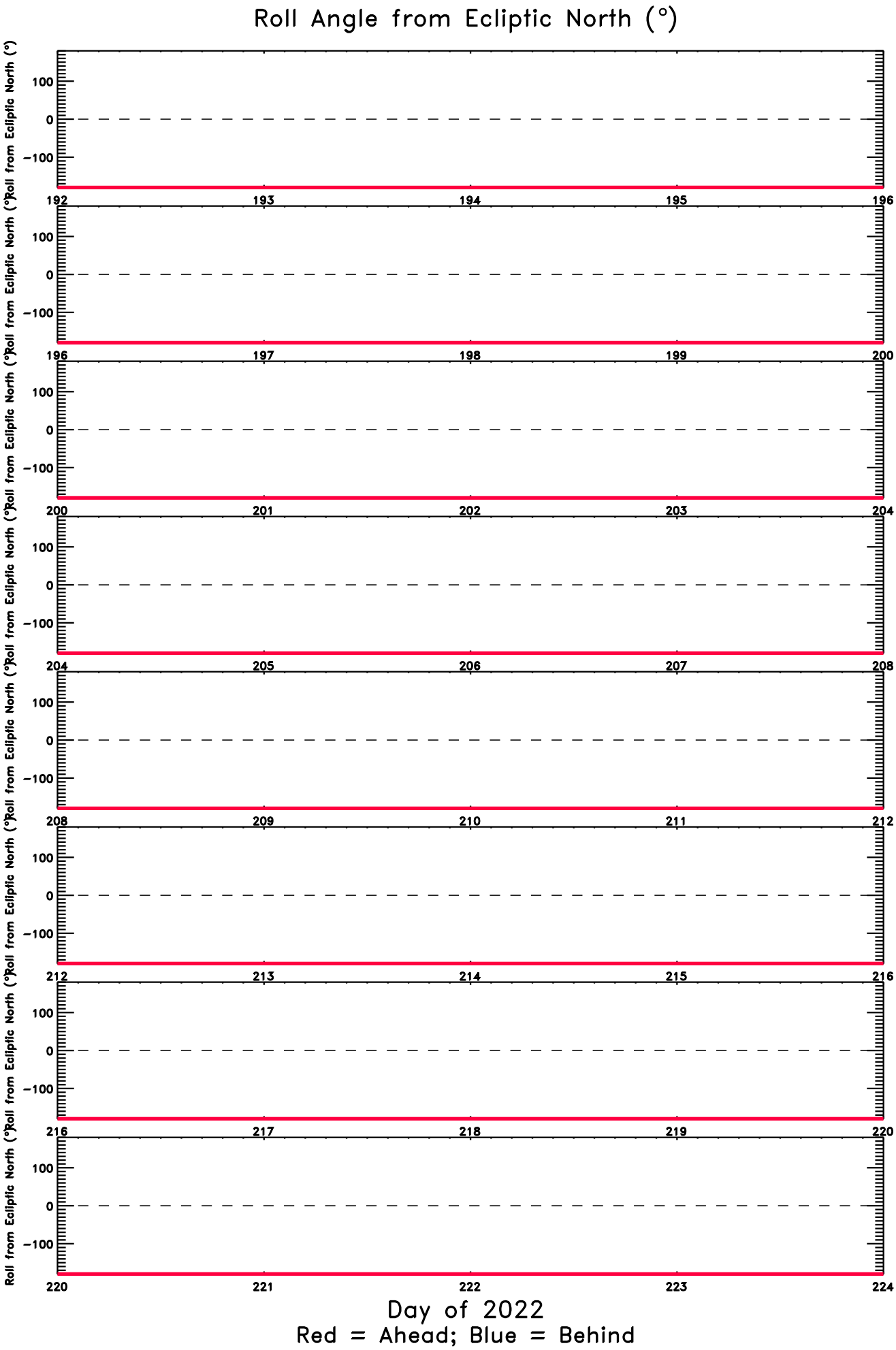
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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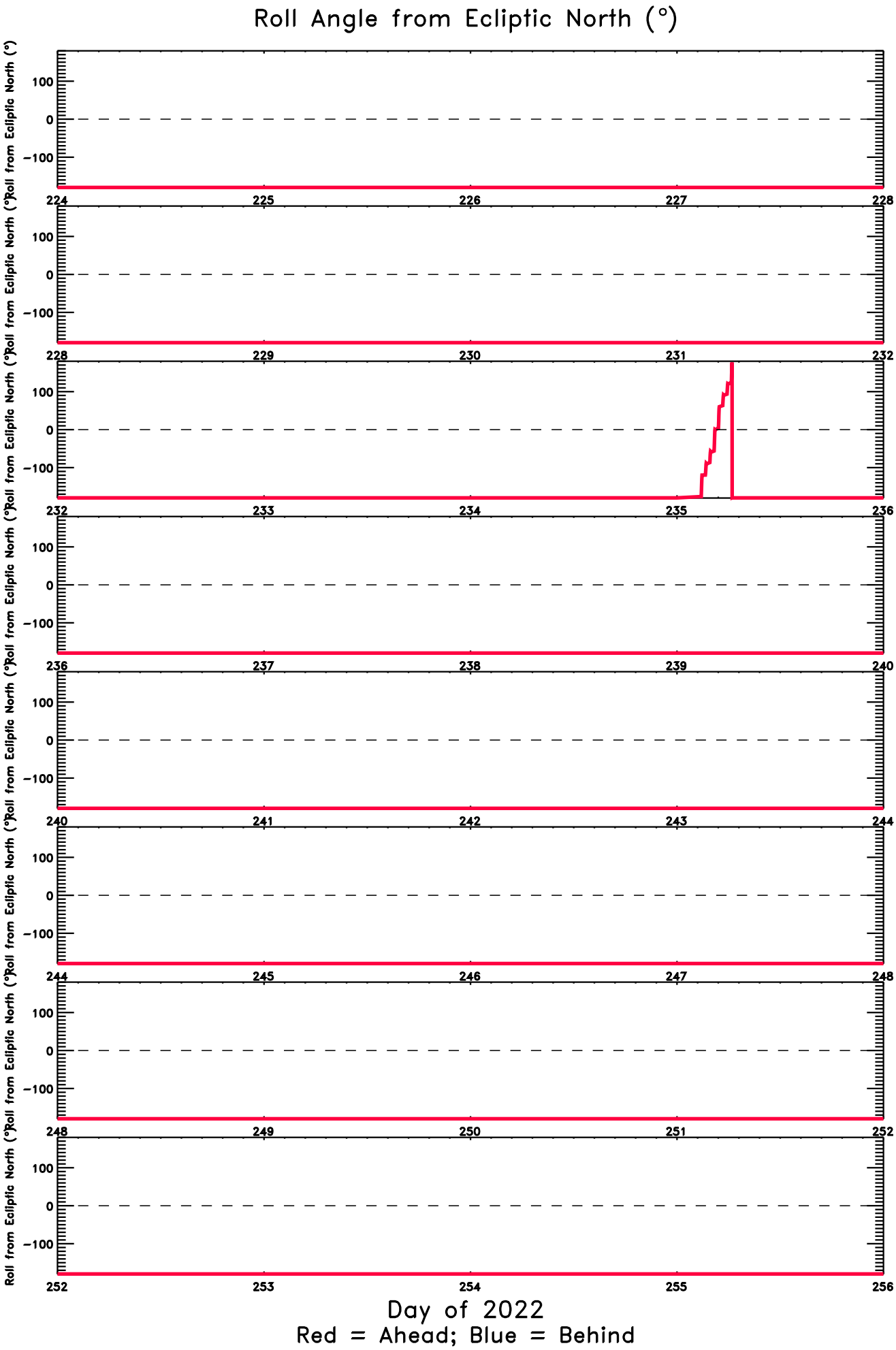
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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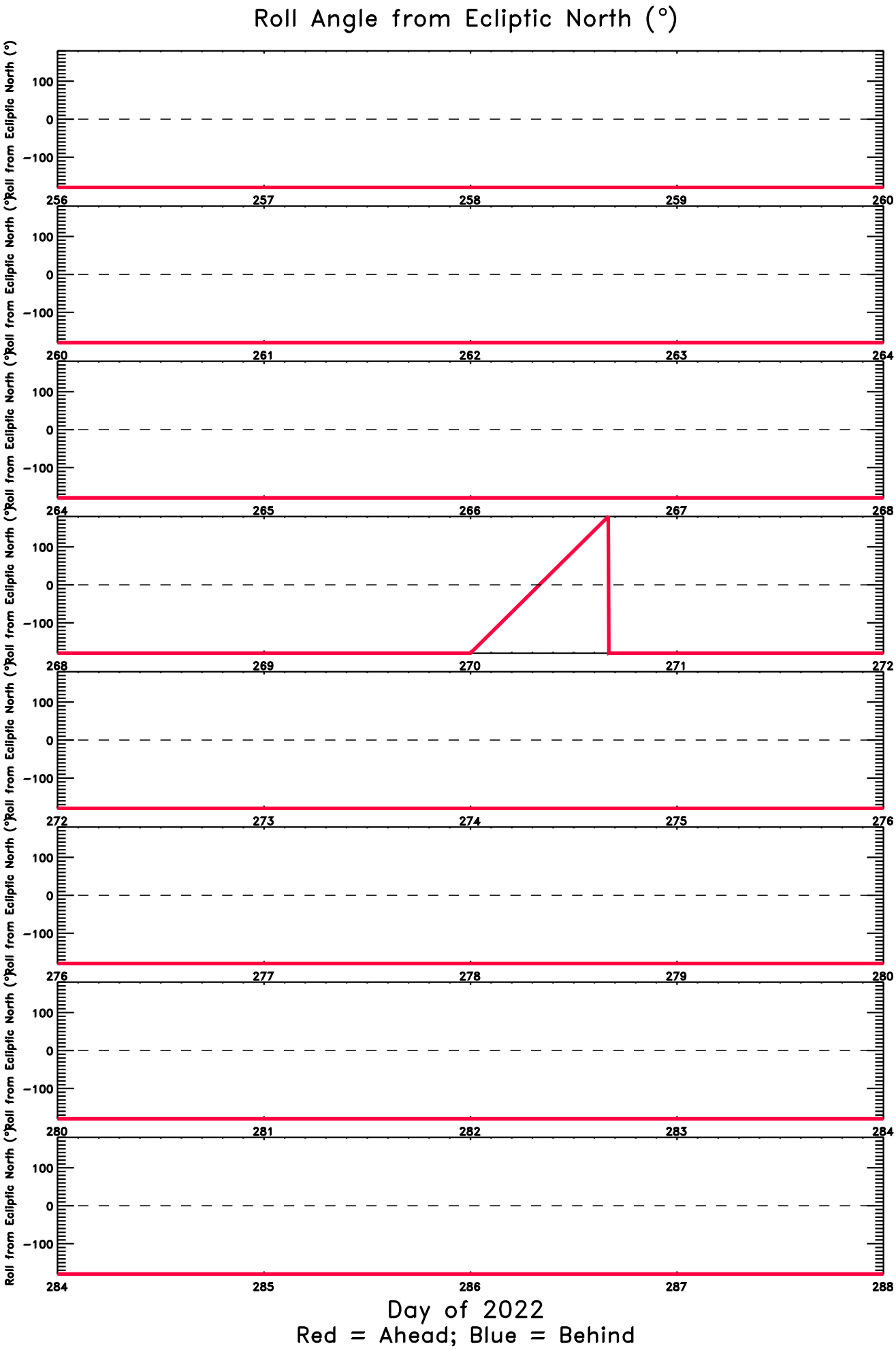
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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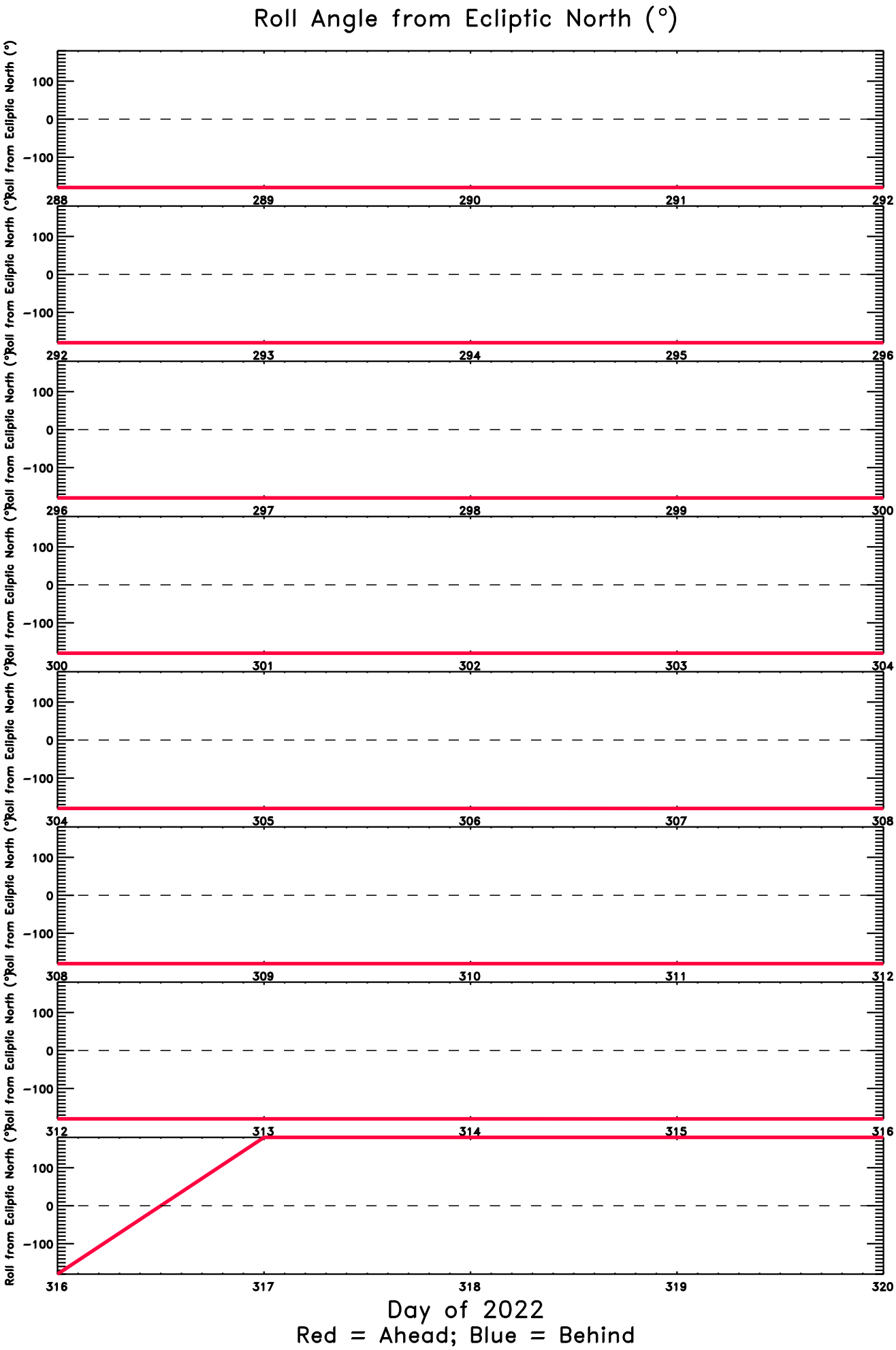
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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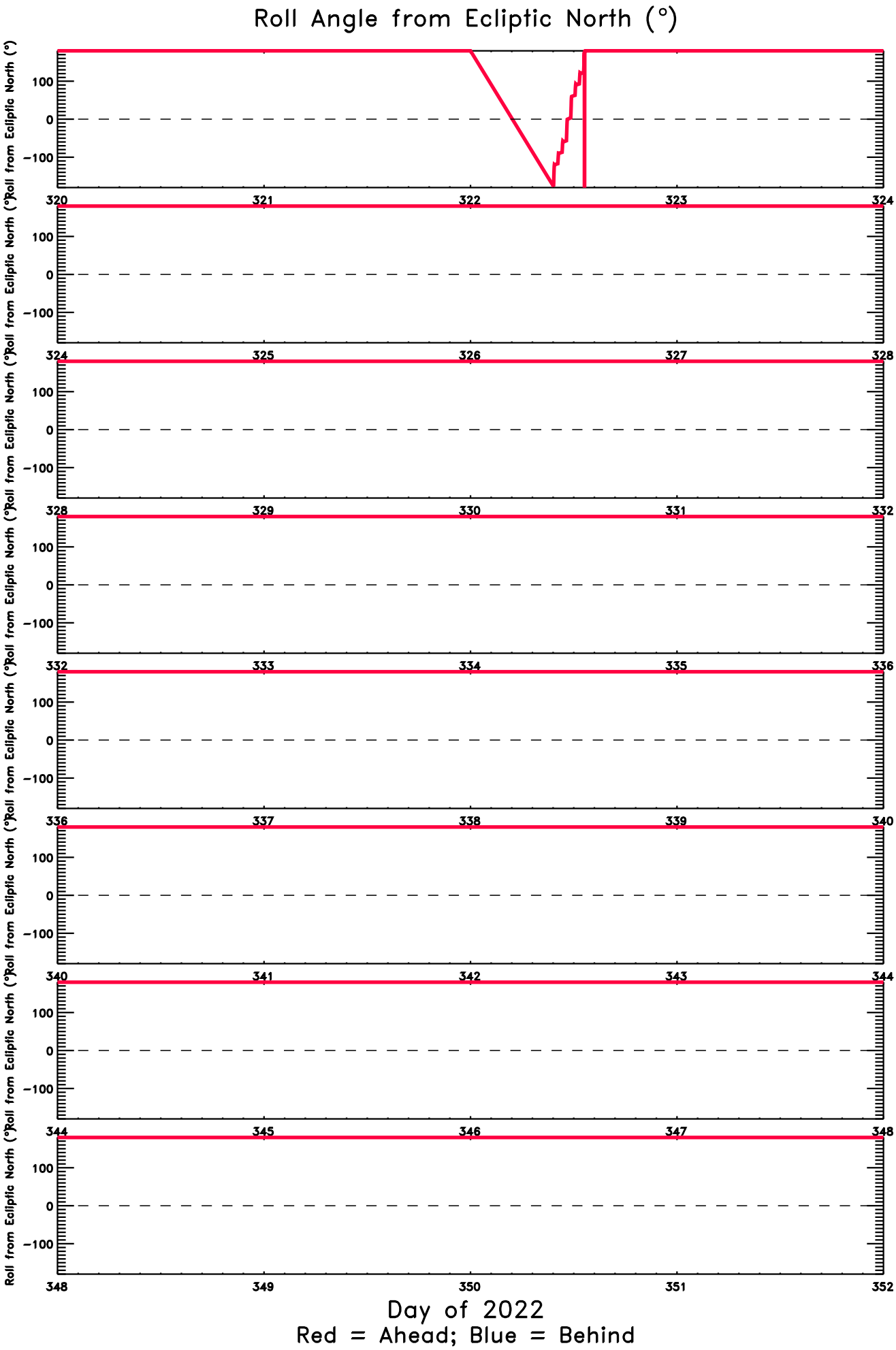
320
Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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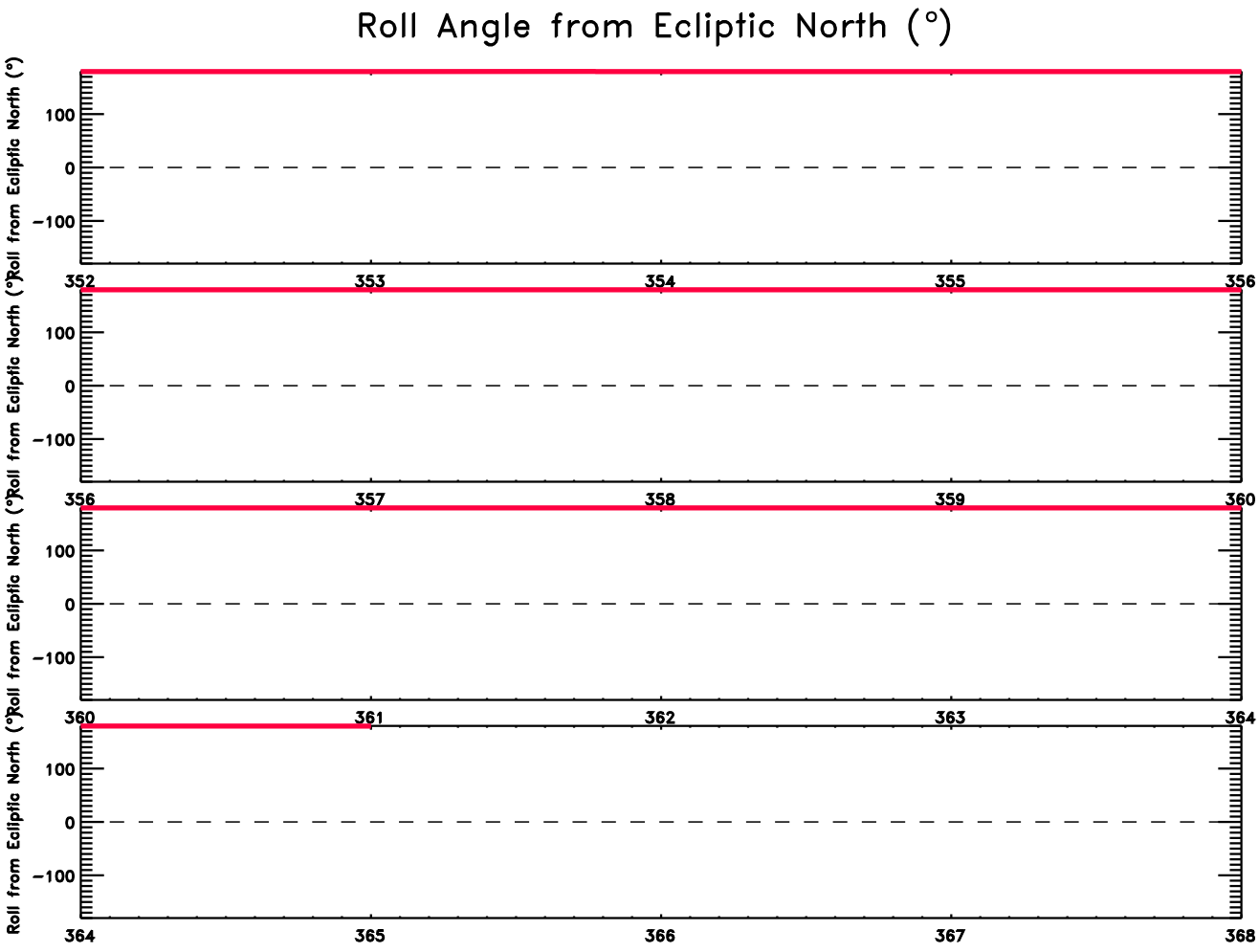
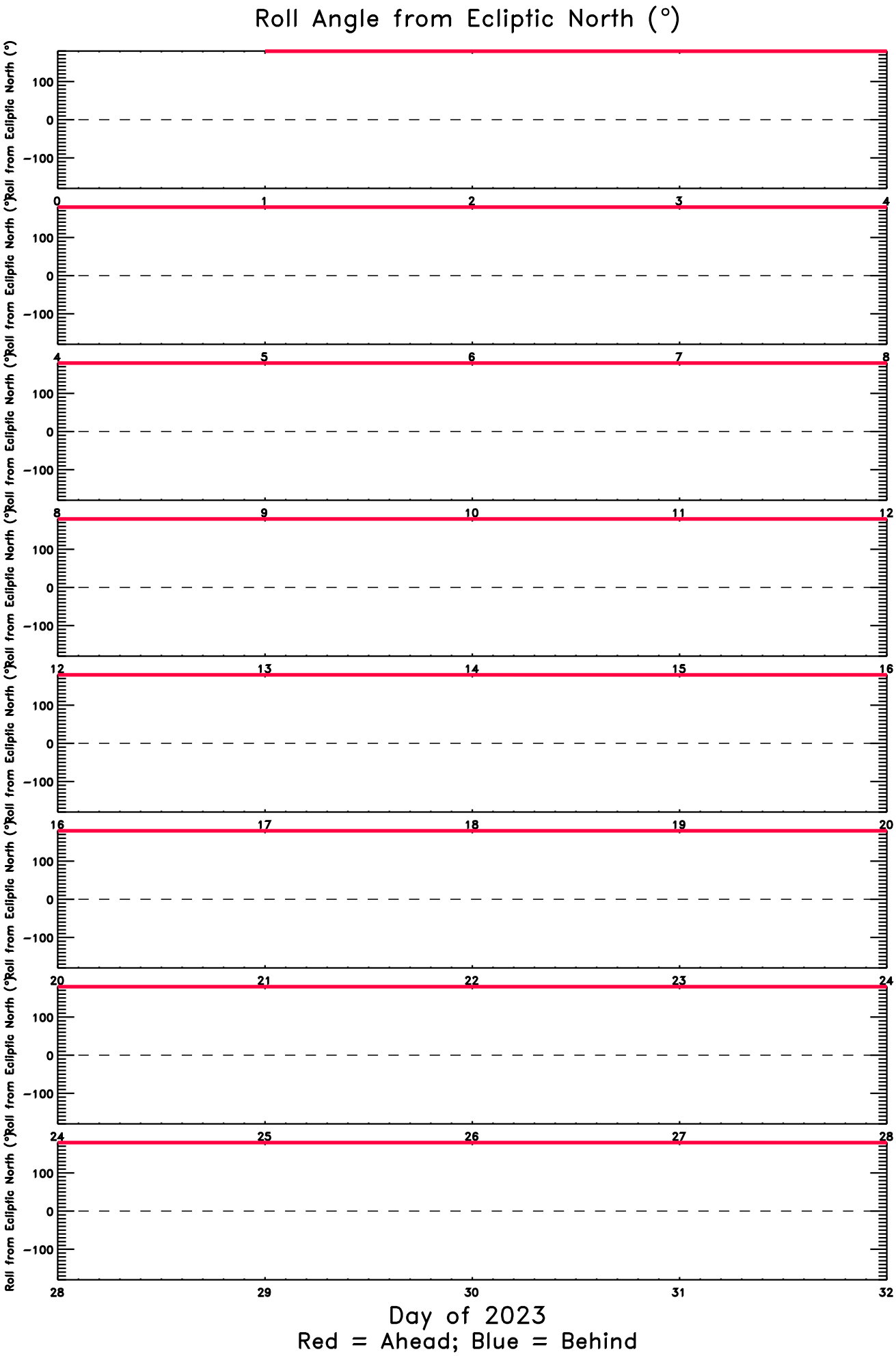
Day of 2022
Red = Ahead; Blue = Behind



Day of 2022
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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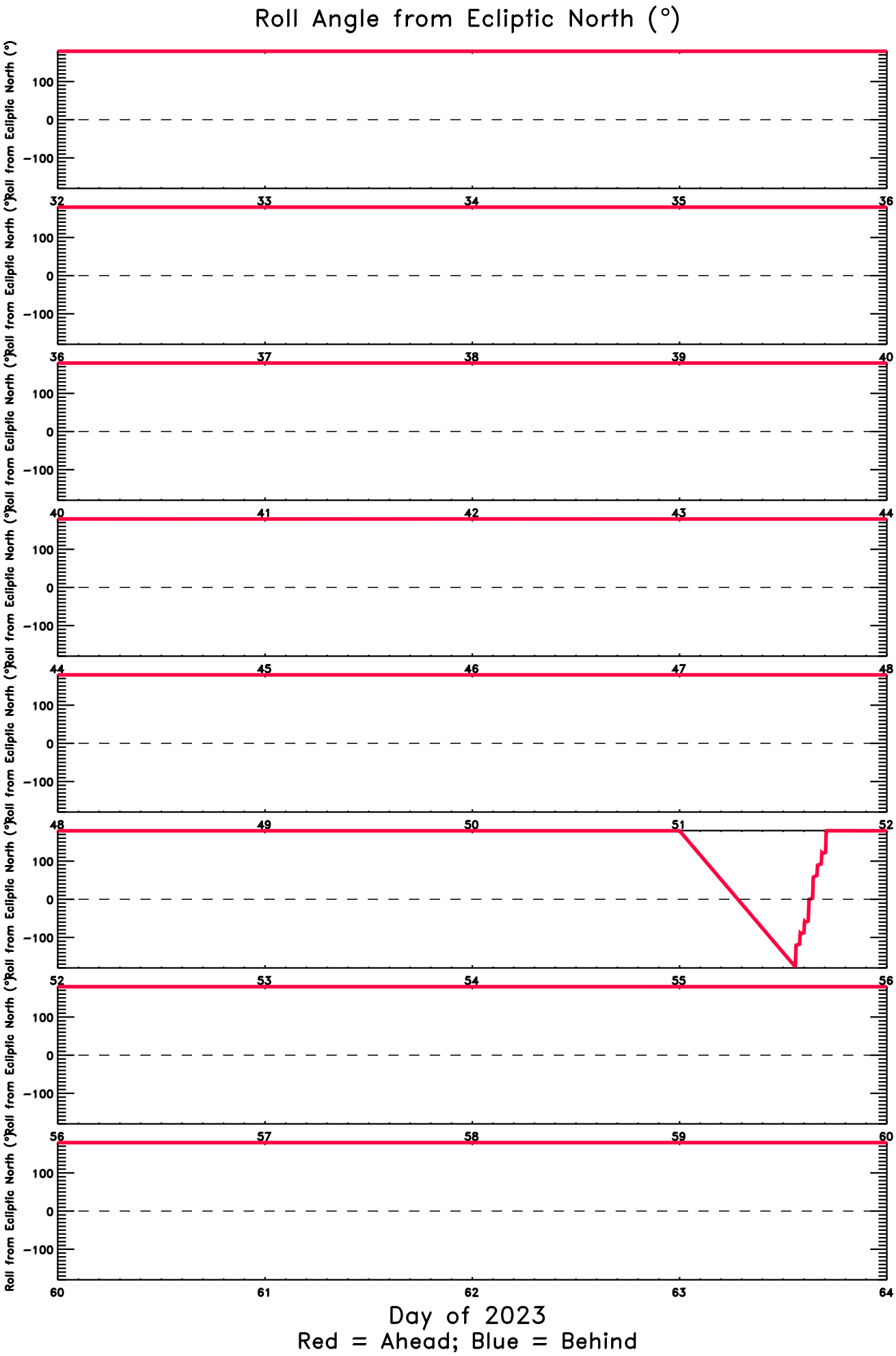
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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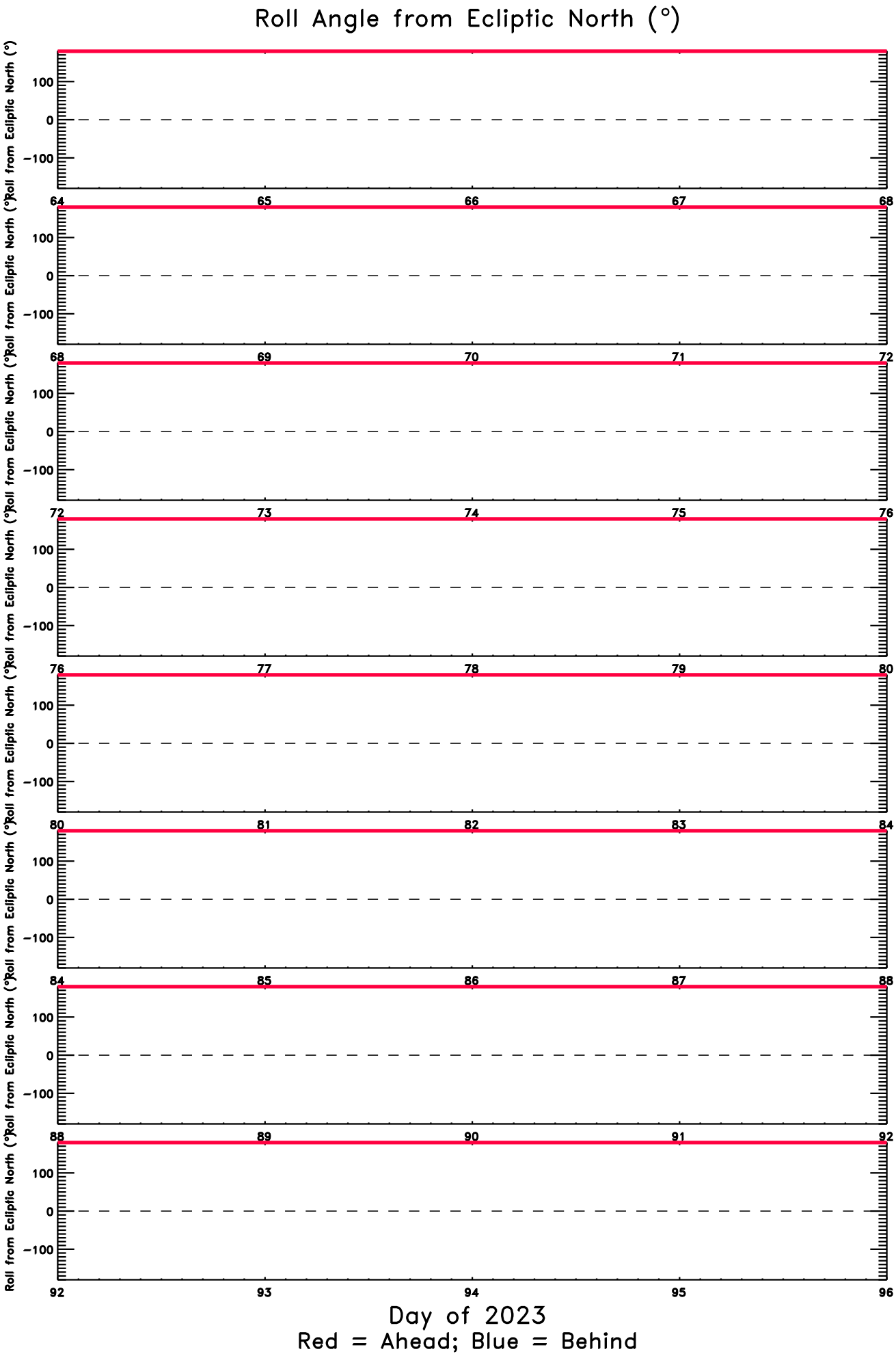
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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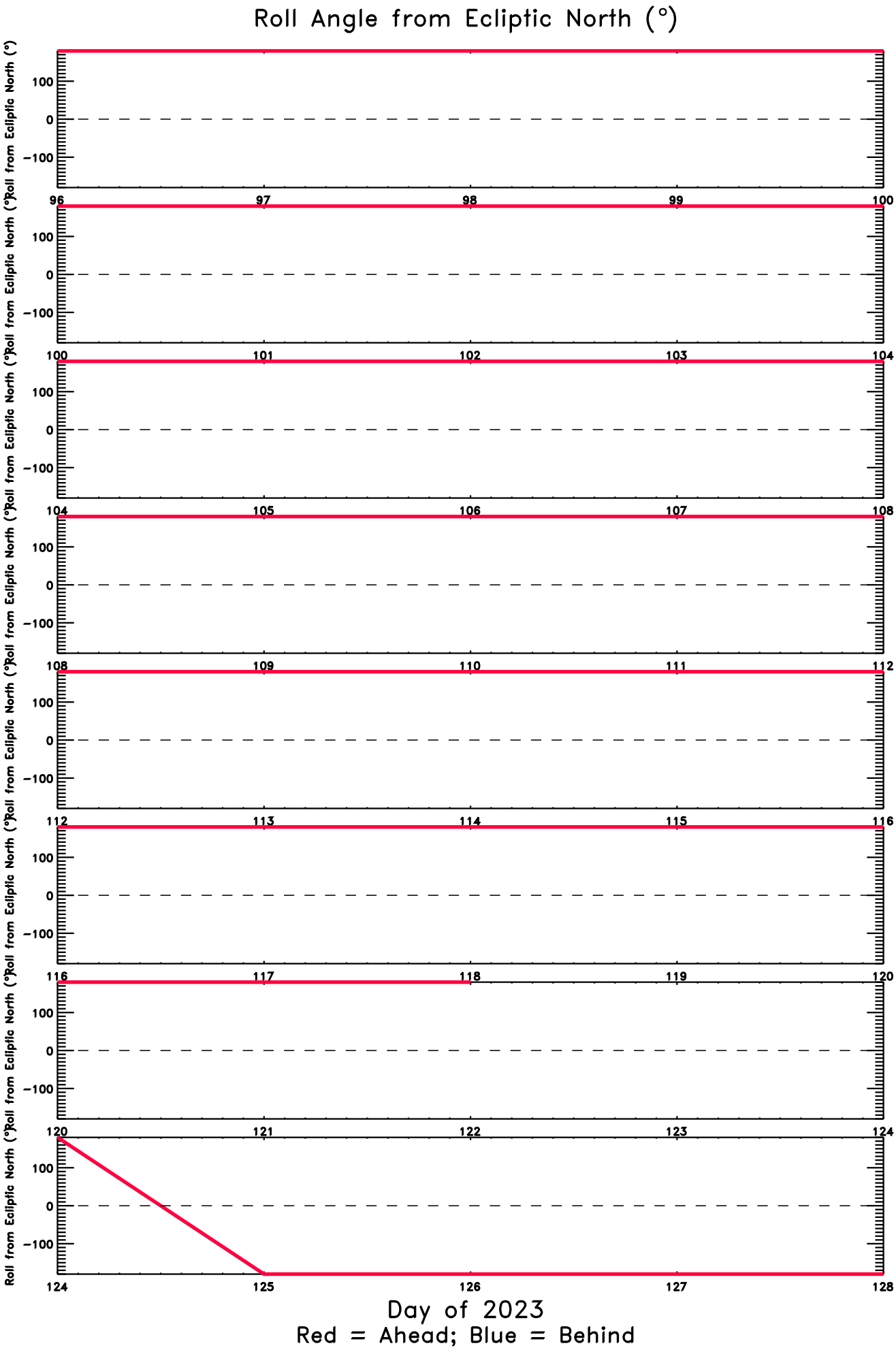
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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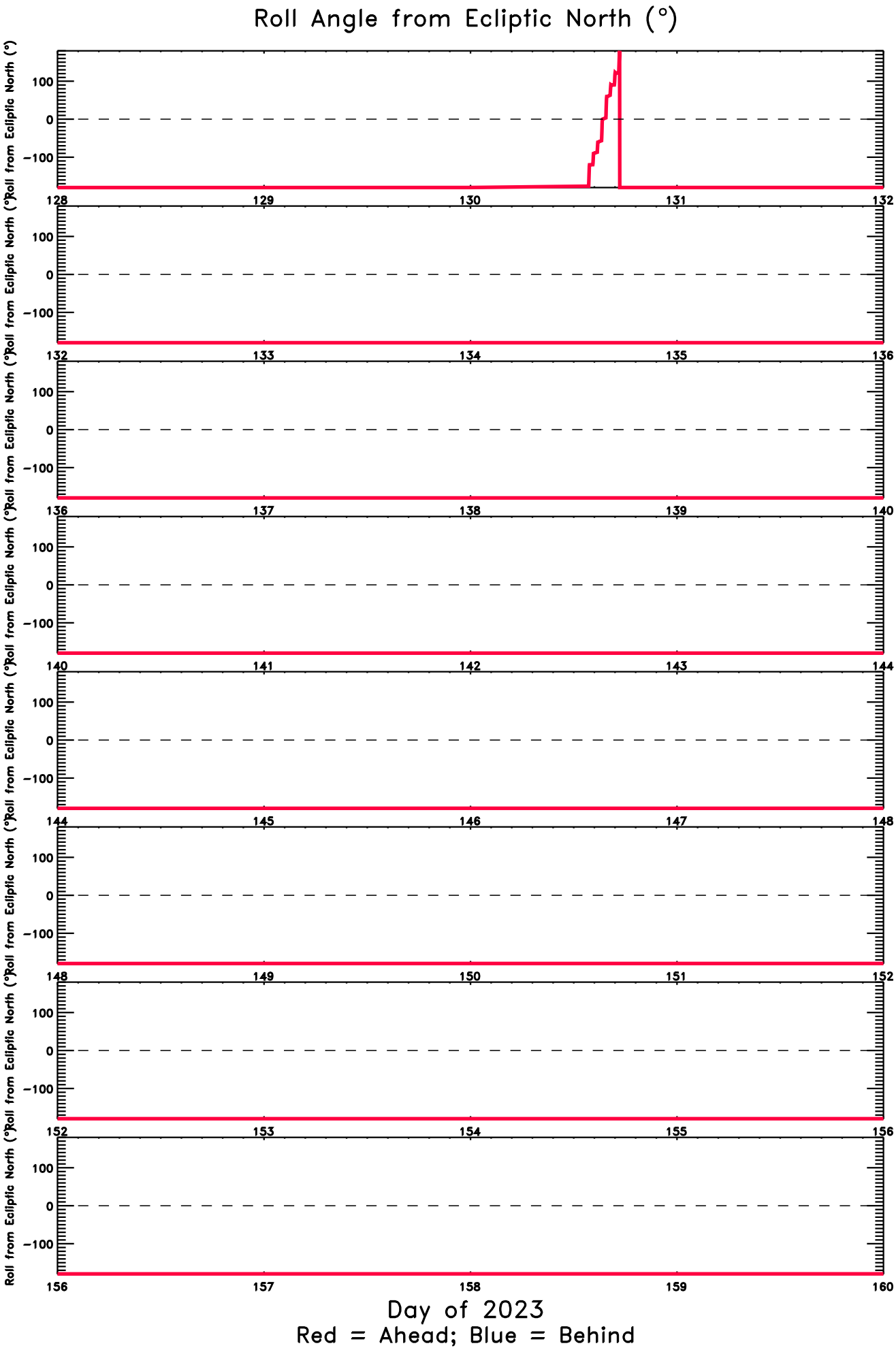
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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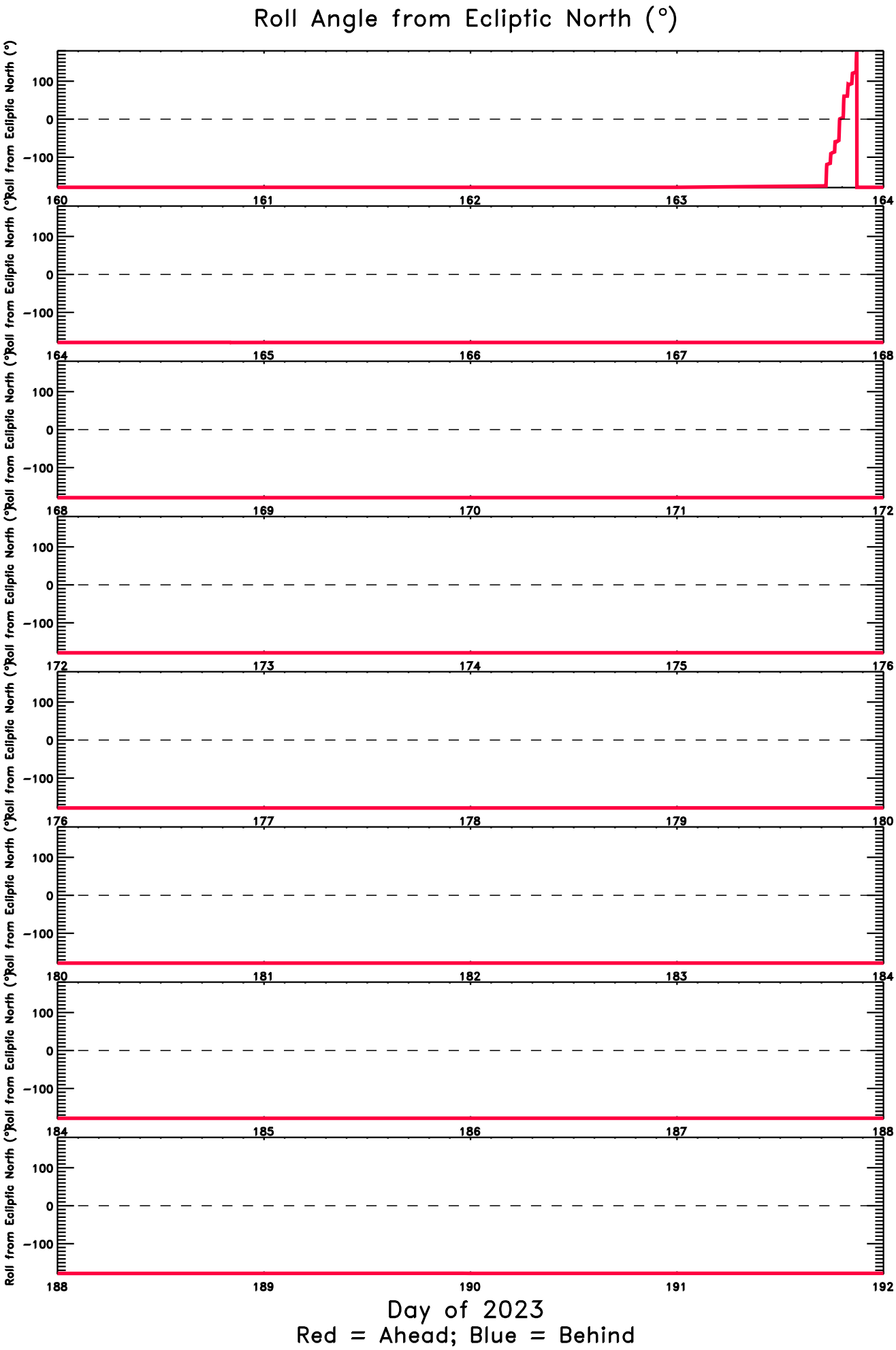
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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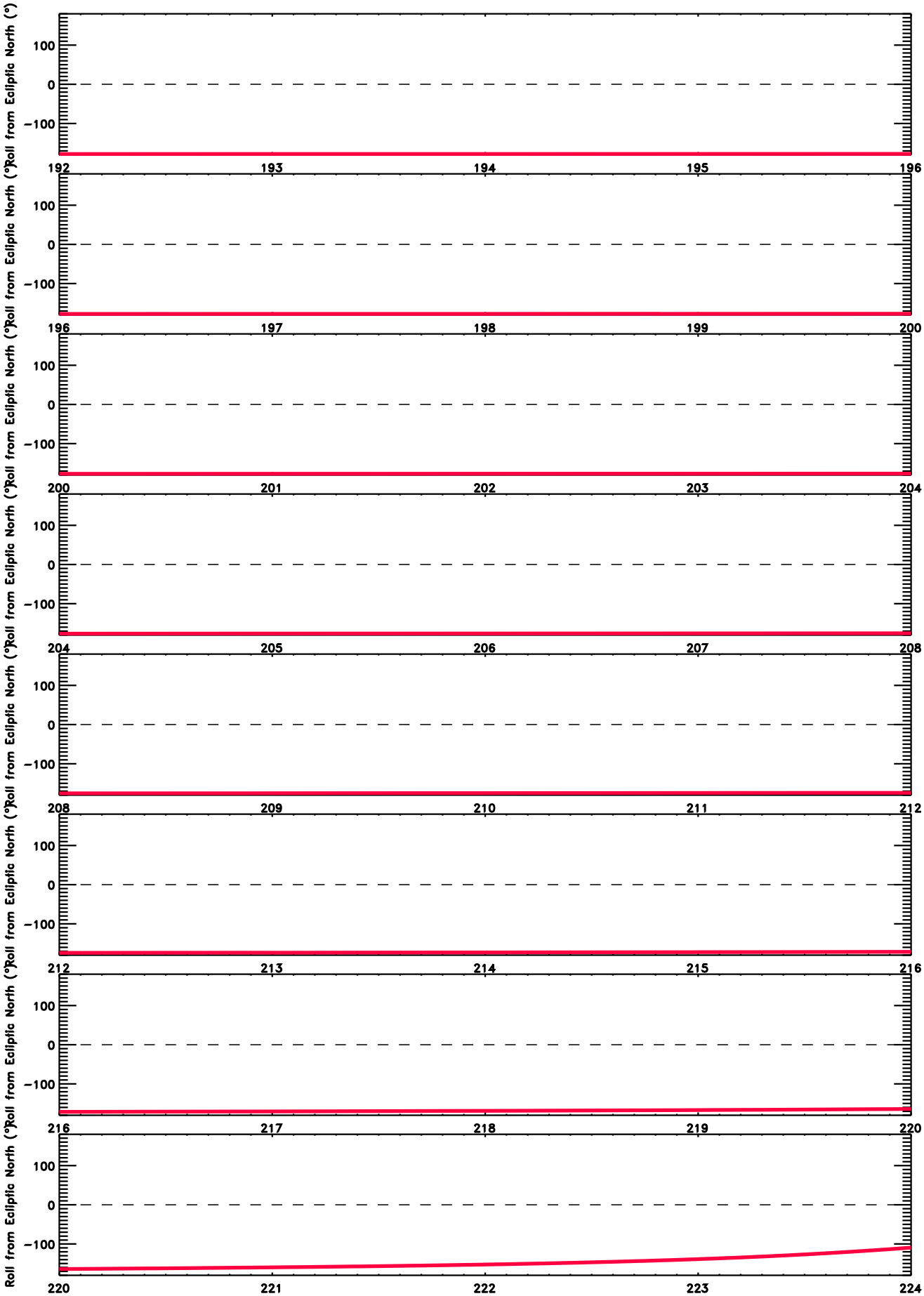
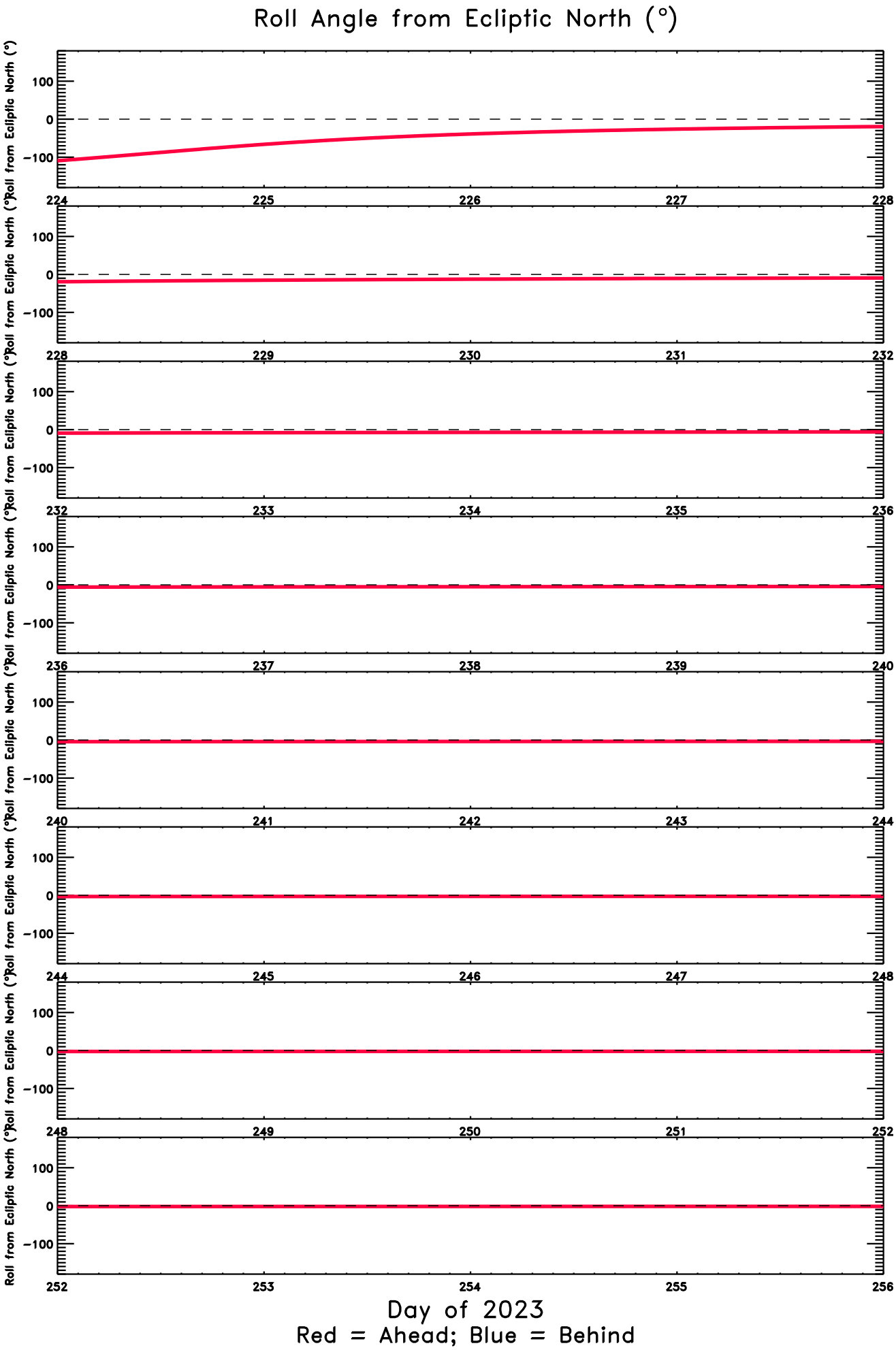
Day of 2023
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2023

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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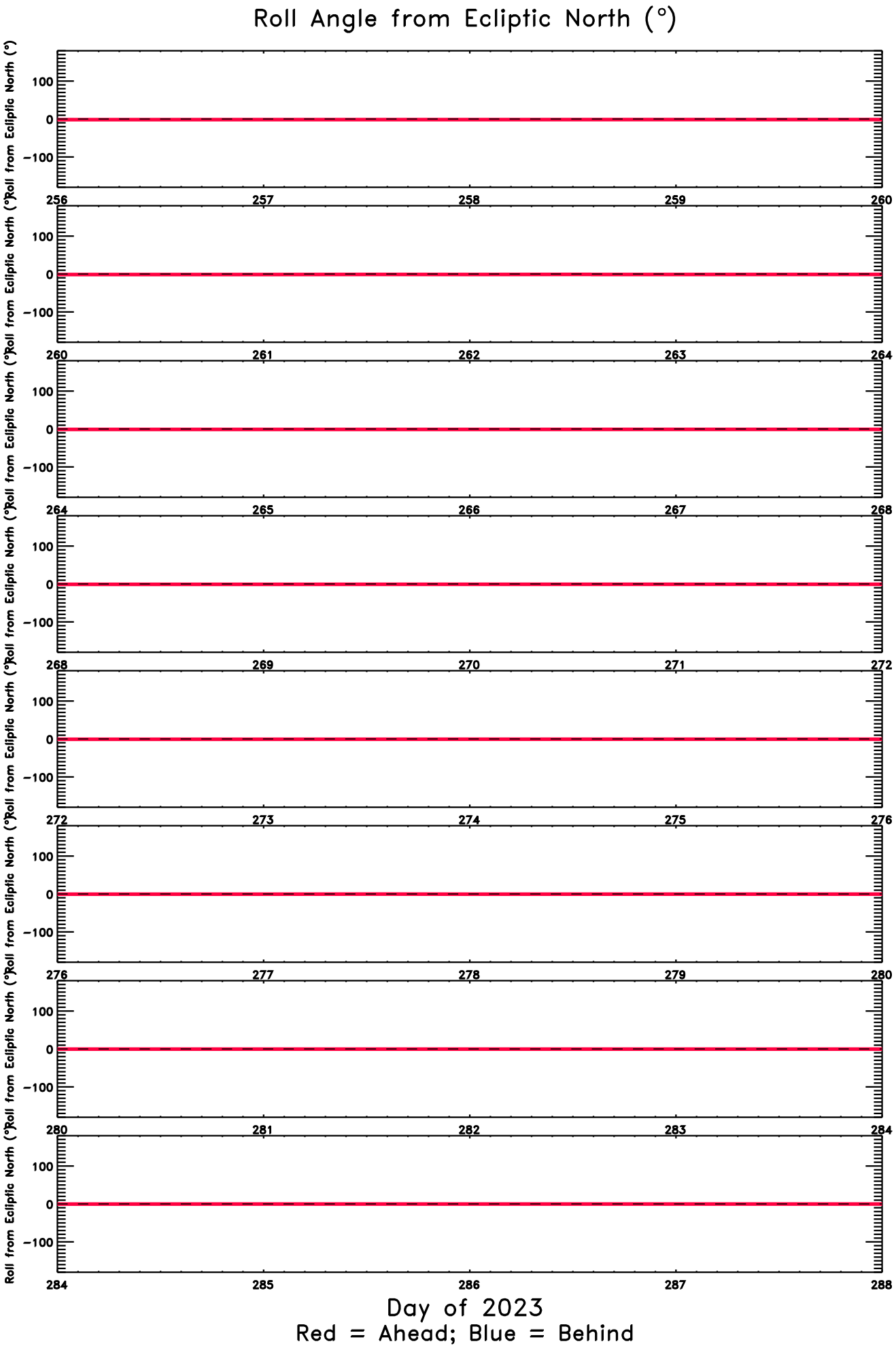
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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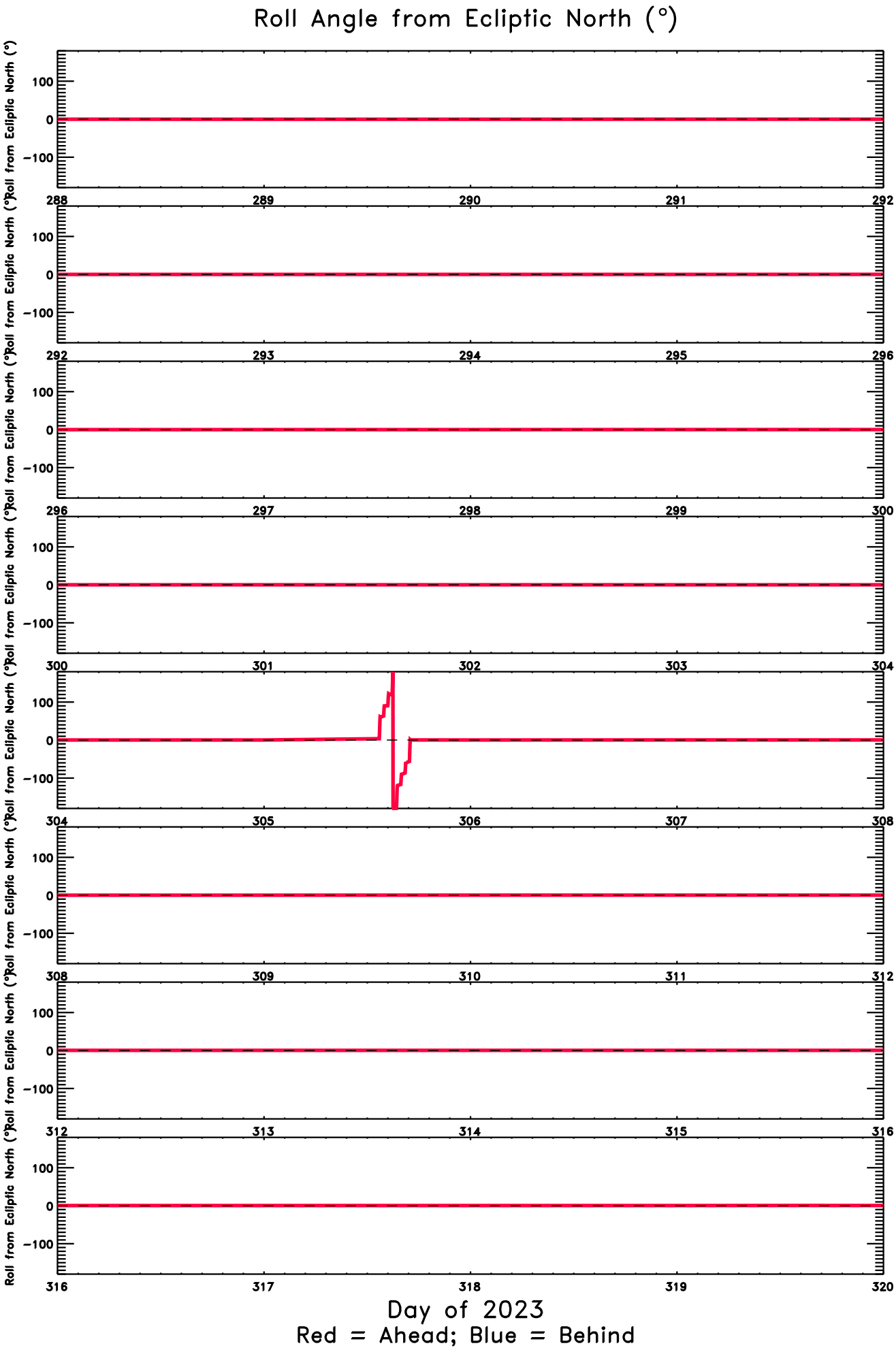
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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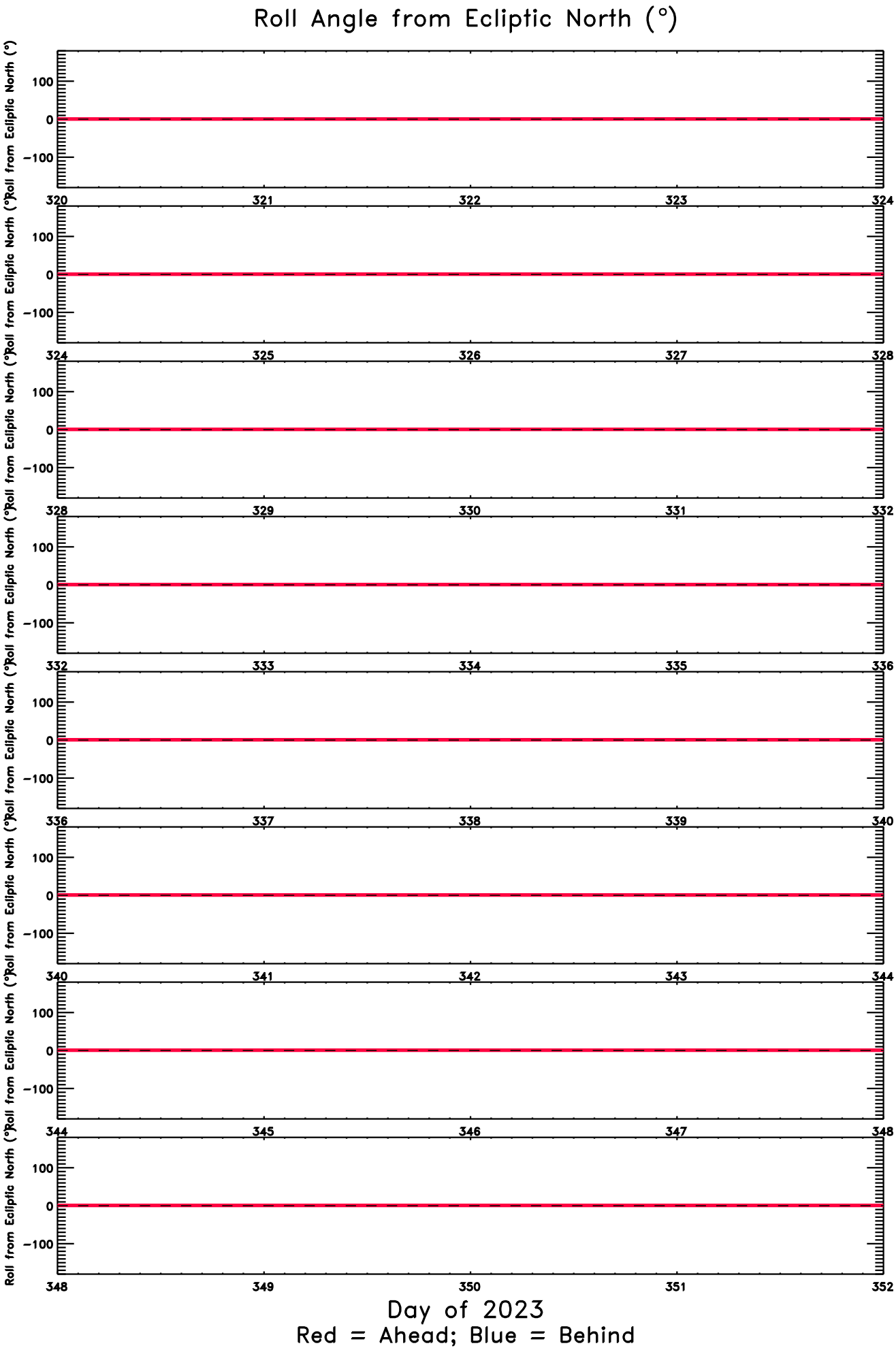
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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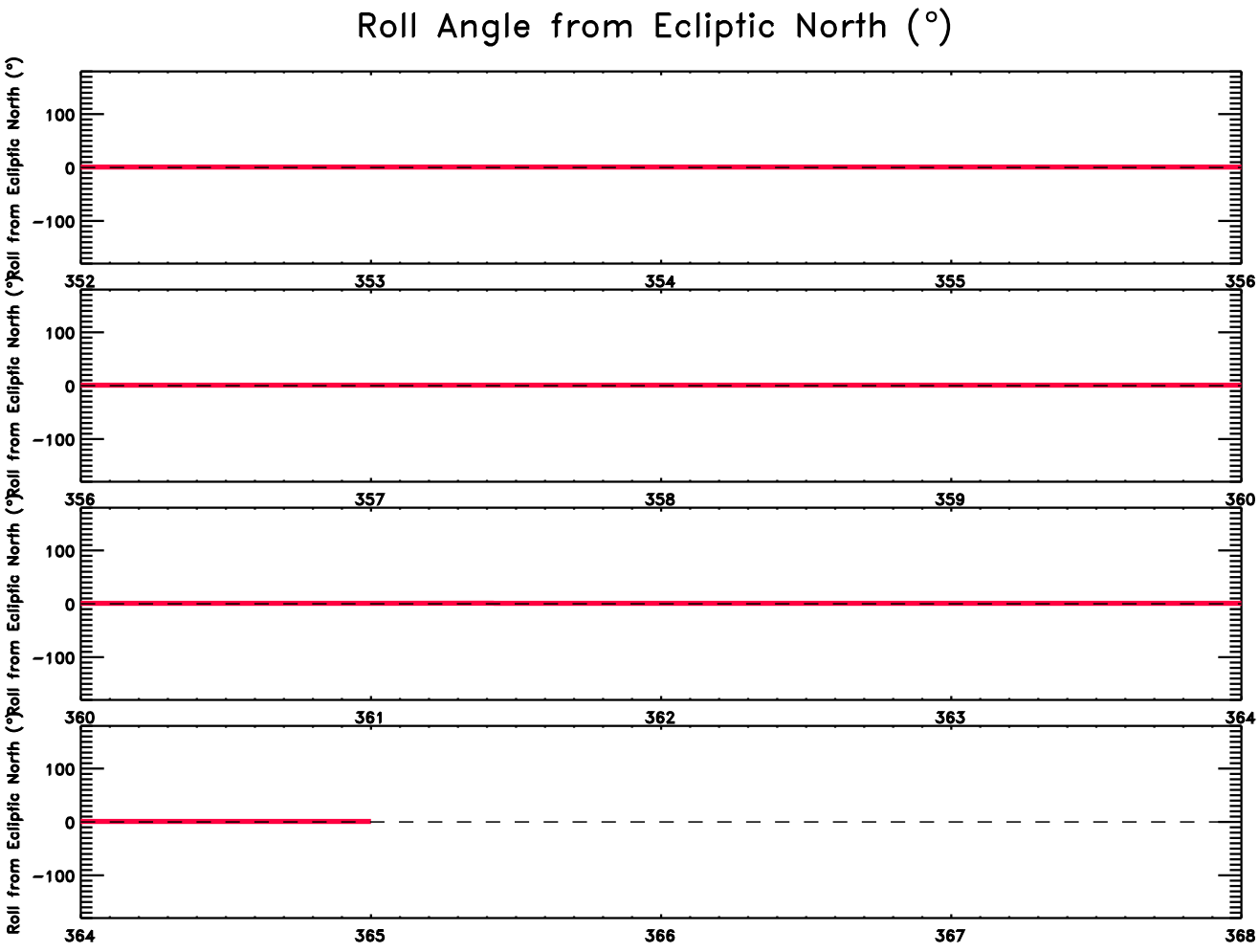
Day of 2023
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
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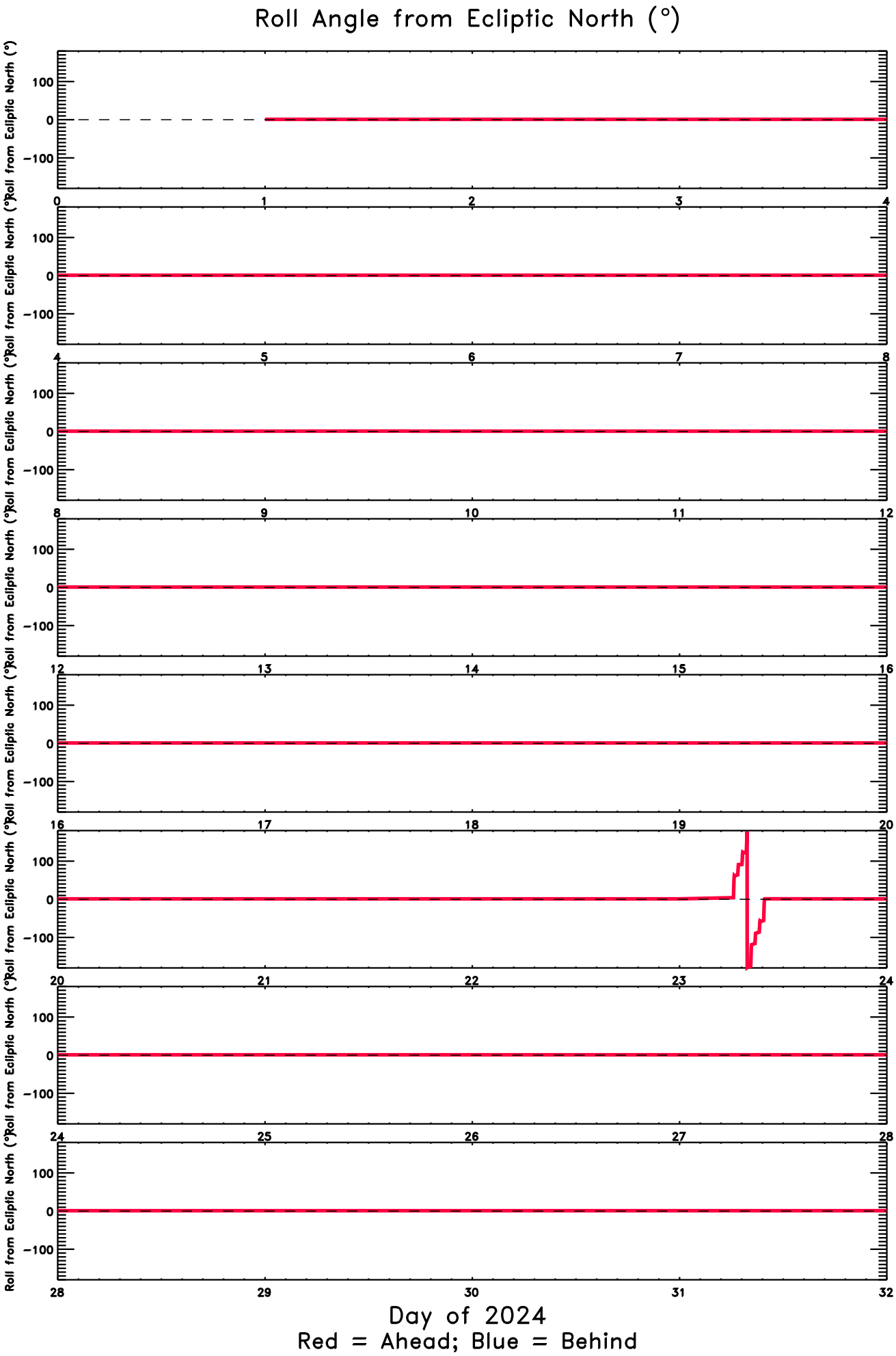
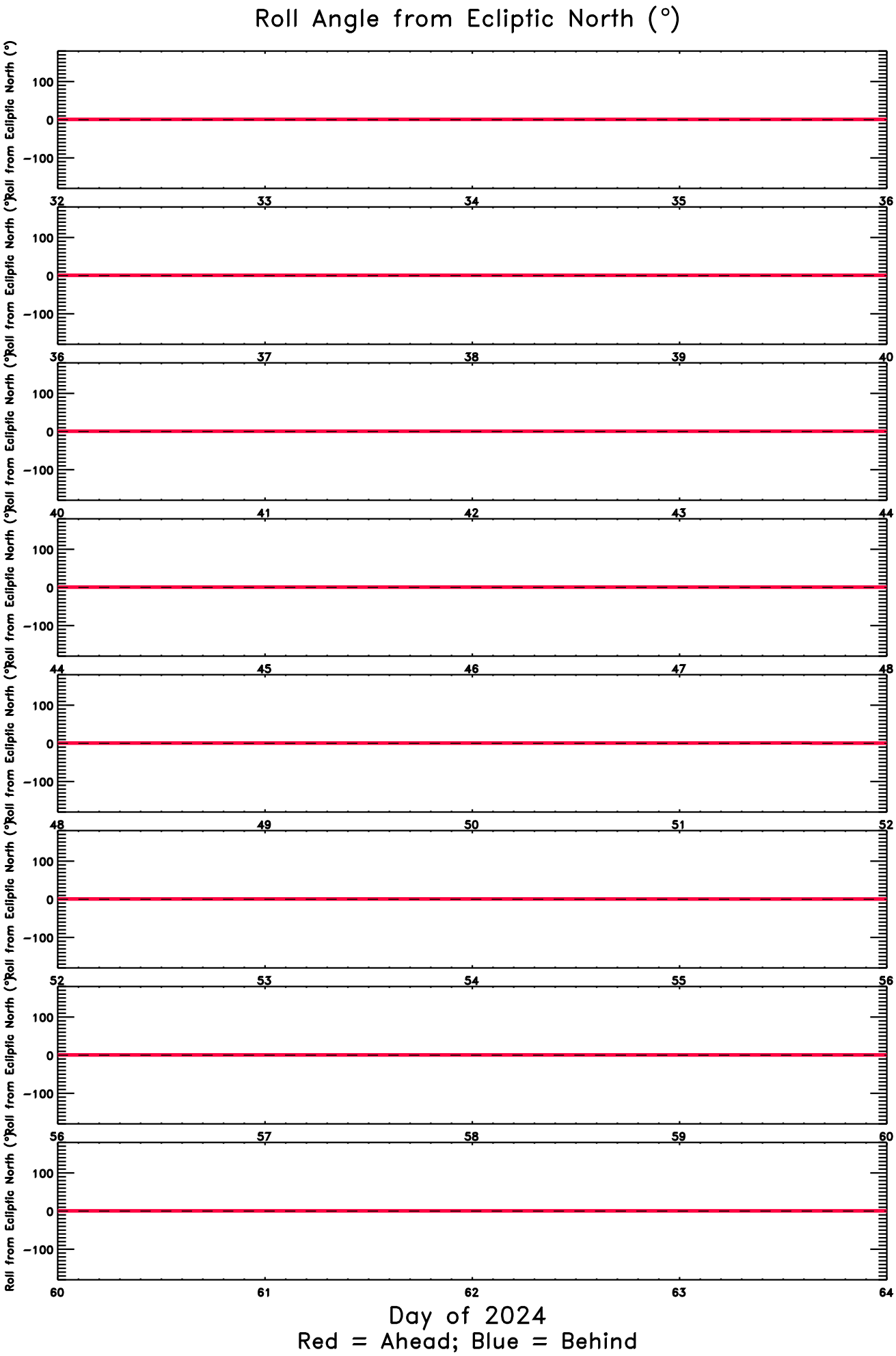
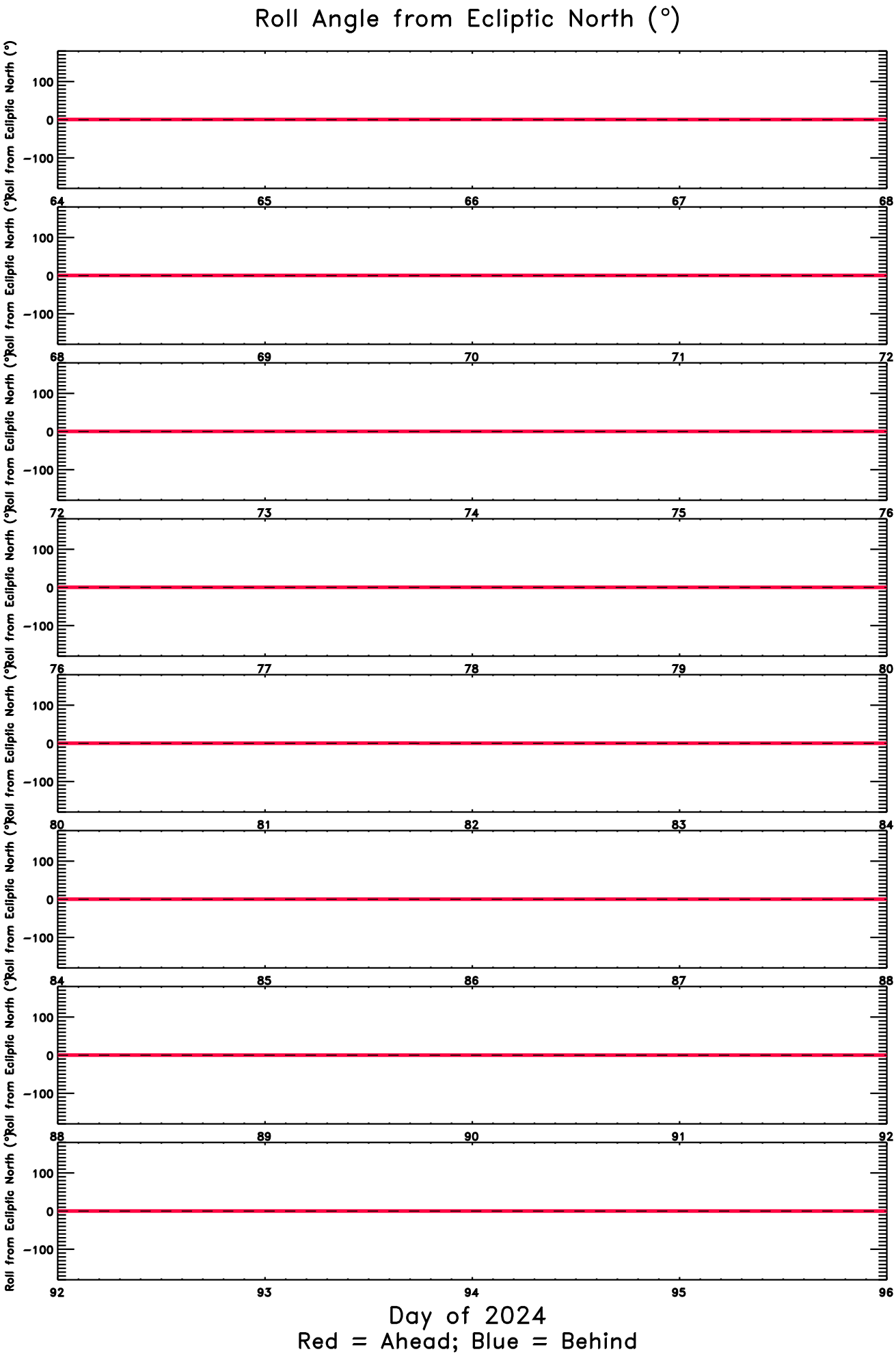
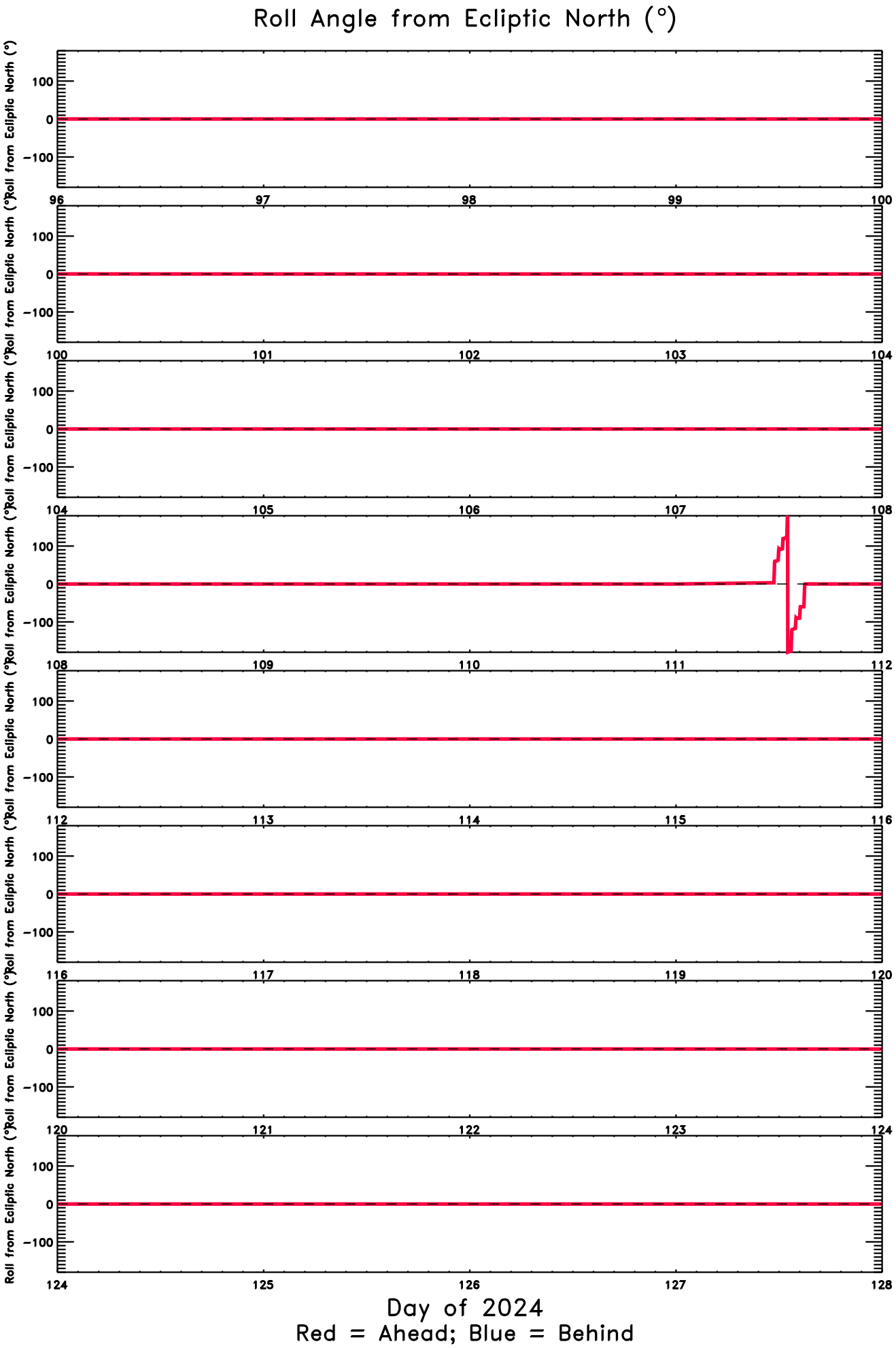
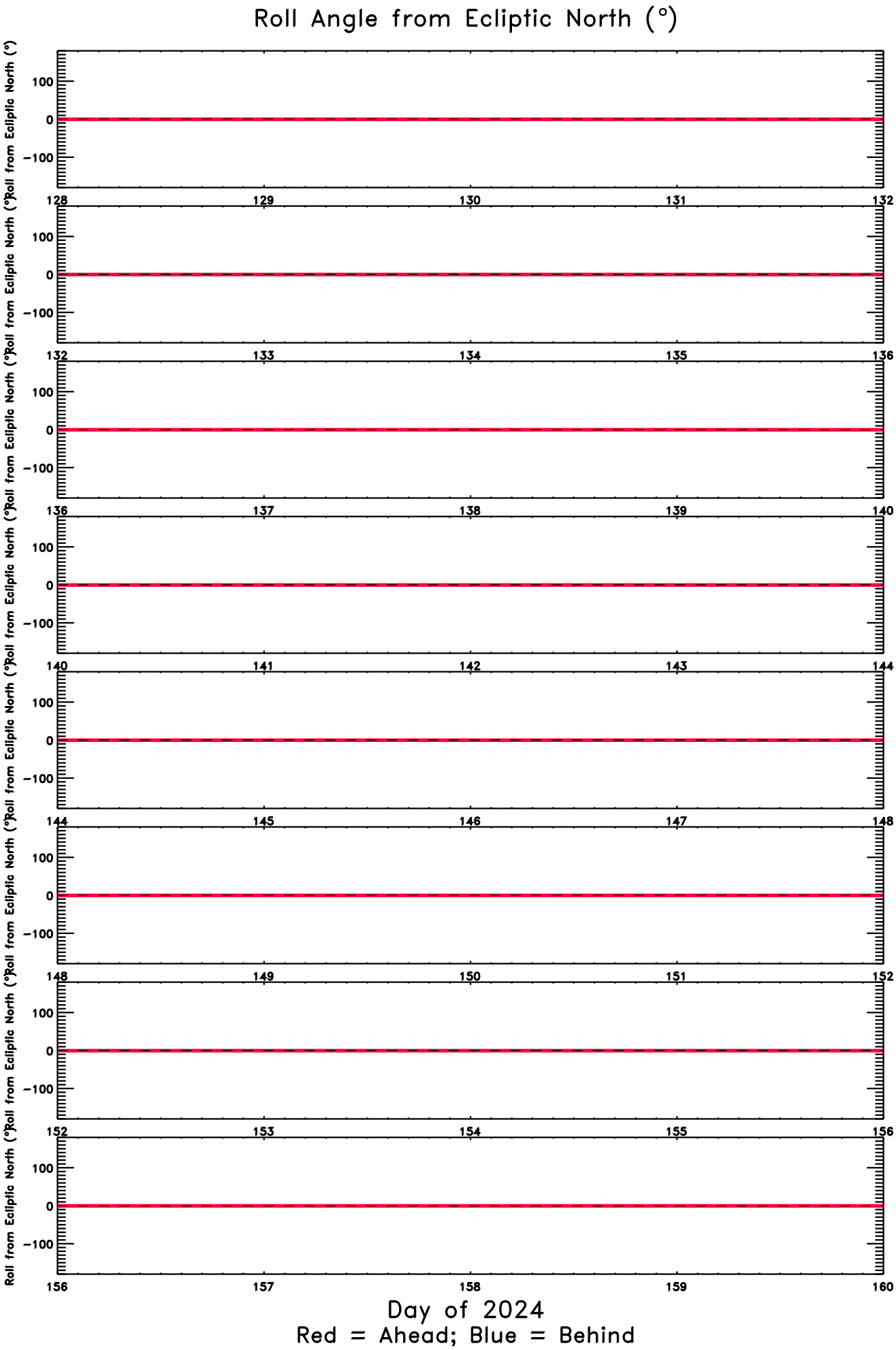
Day of 2023
Red = Ahead; Blue = Behind

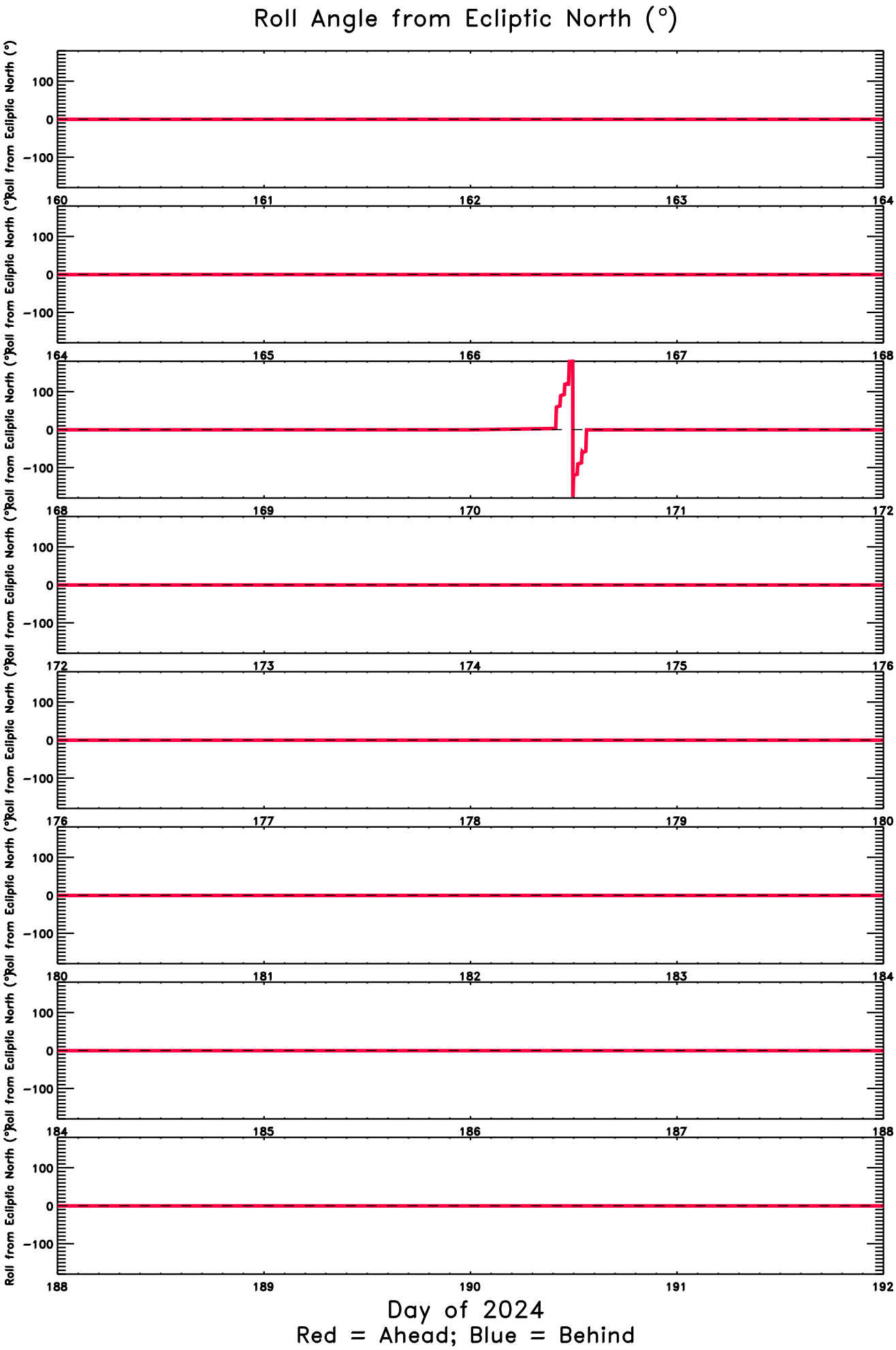

Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
Day of 2024
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
Day of 2024
Red = Ahead; Blue = Behind

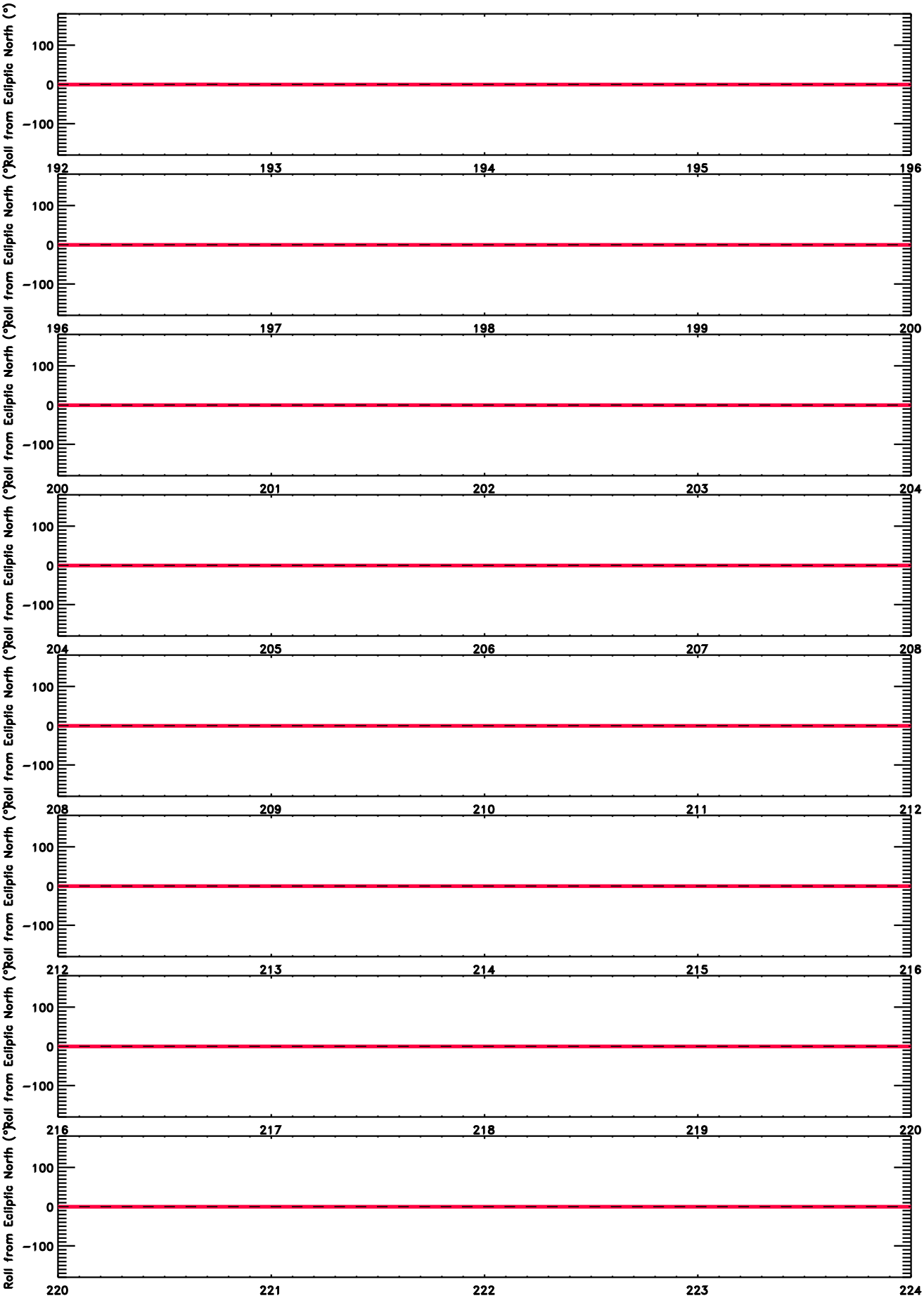

Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
Day of 2024
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
Day of 2024
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
Day of 2024
Red = Ahead; Blue = Behind

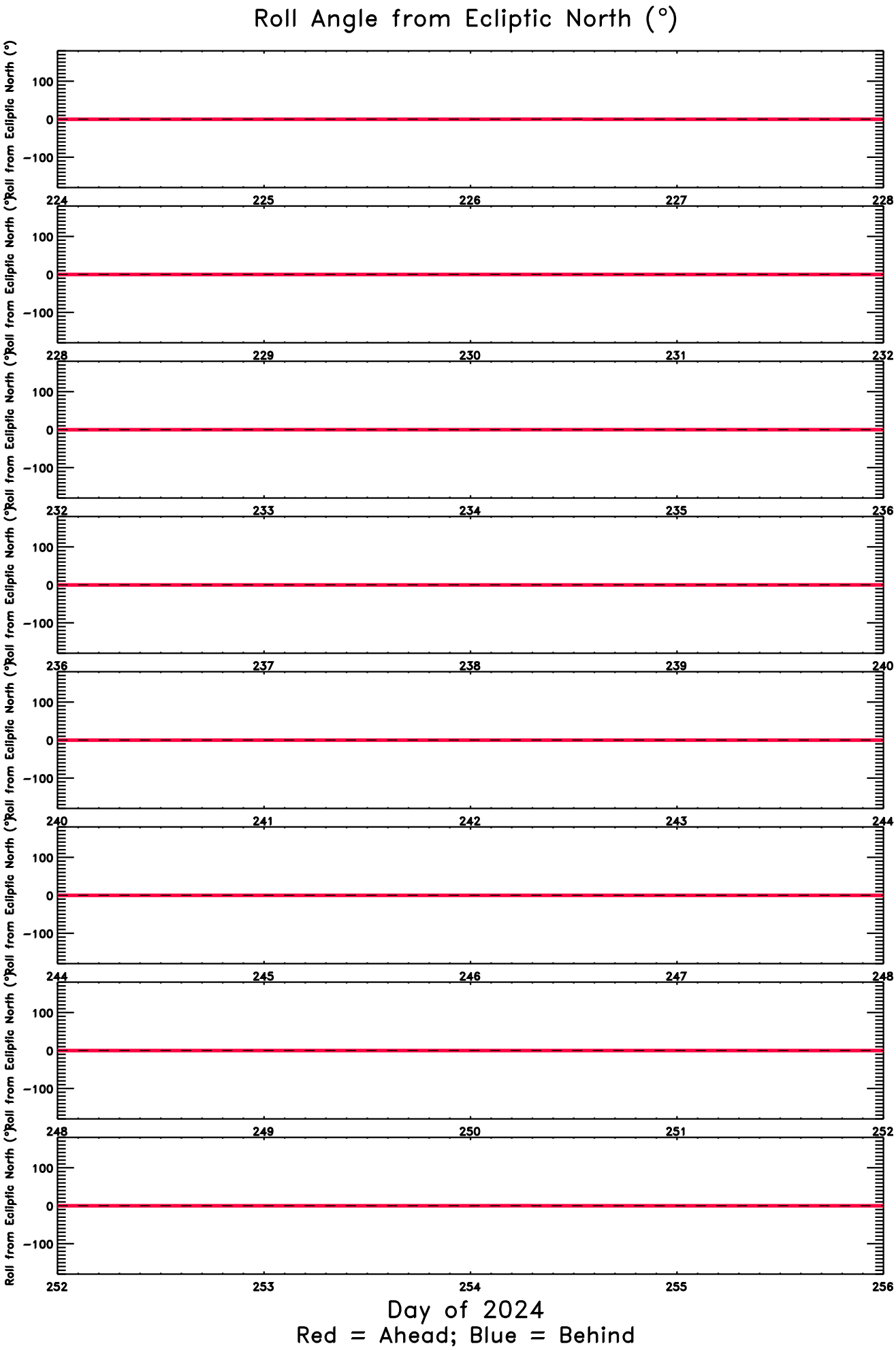

Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
Day of 2024
Red = Ahead; Blue = Behind

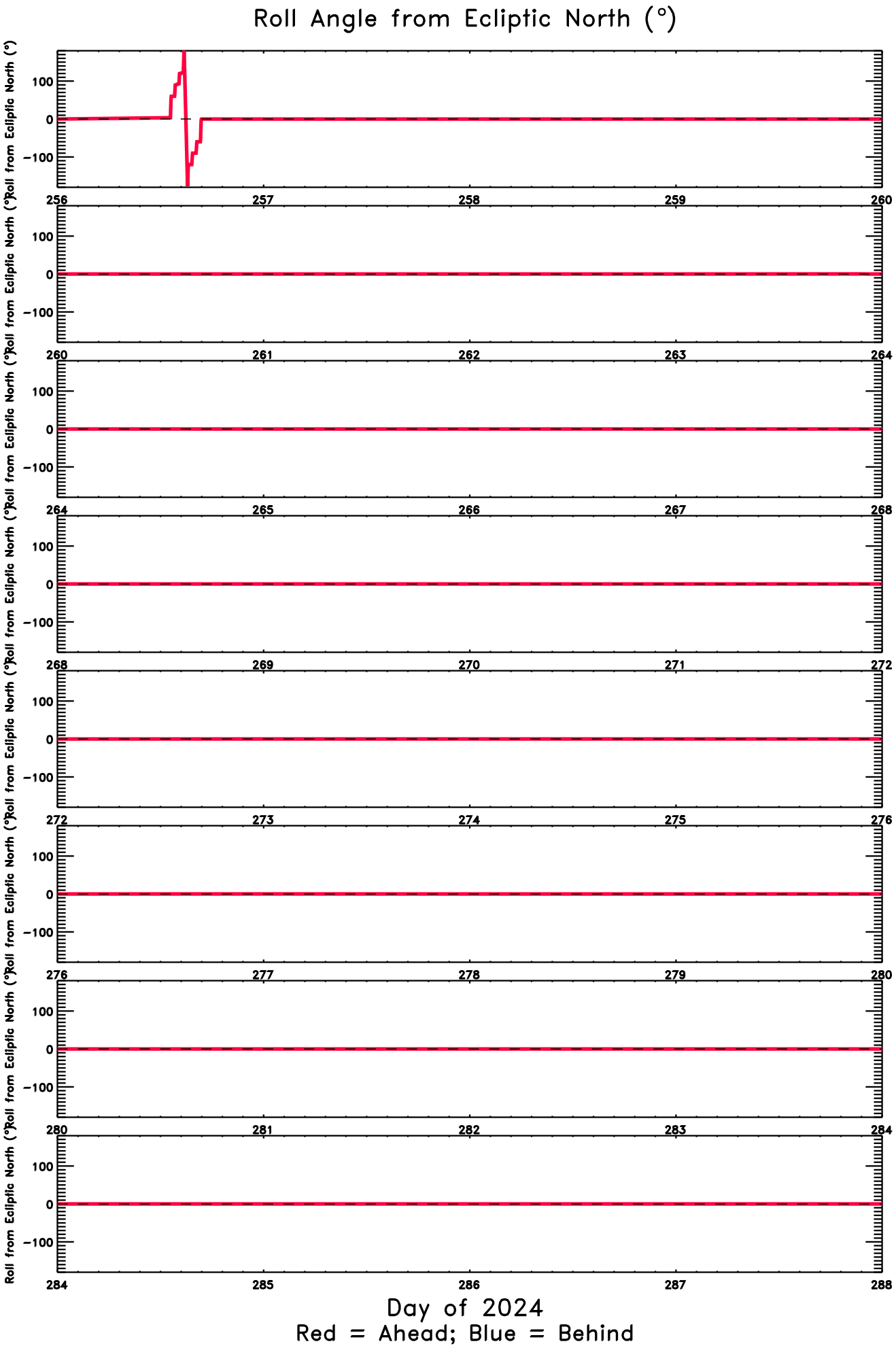
Roll Angle from Ecliptic North (°)

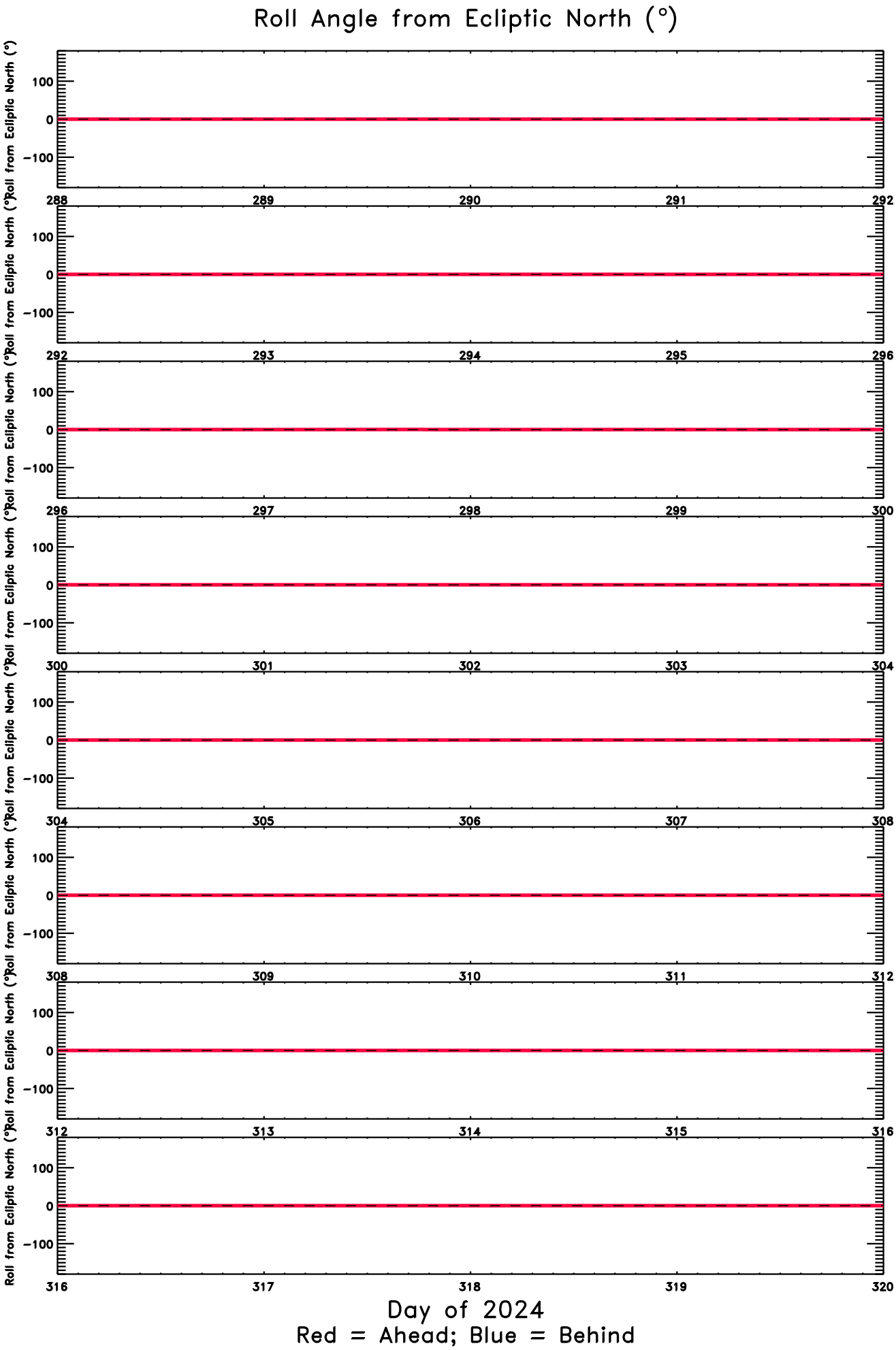


Day of 2024

Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
Day of 2024
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
Day of 2024
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
0
−100
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
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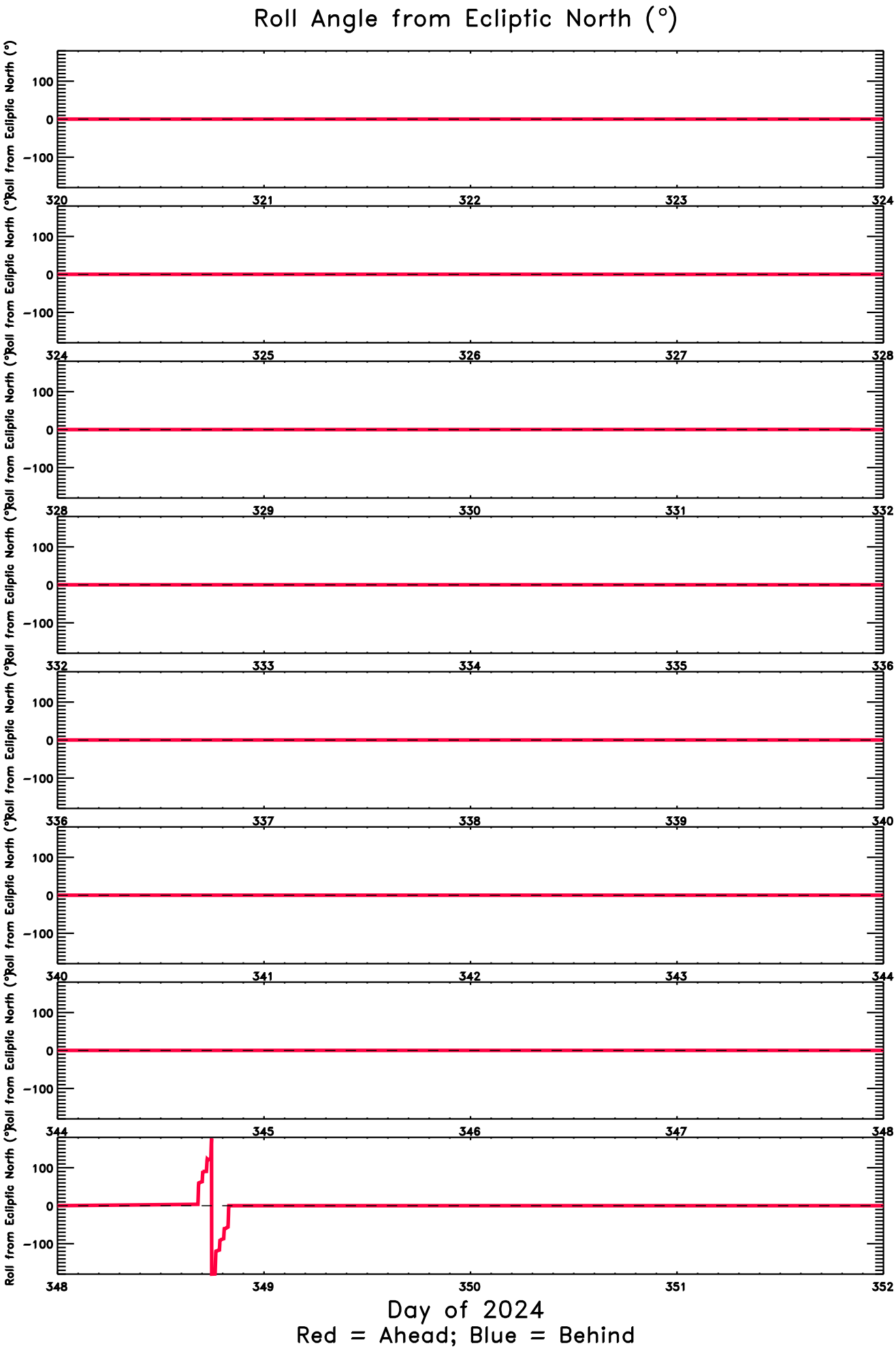
314
315
316
317
318
319
320
Day of 2024
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
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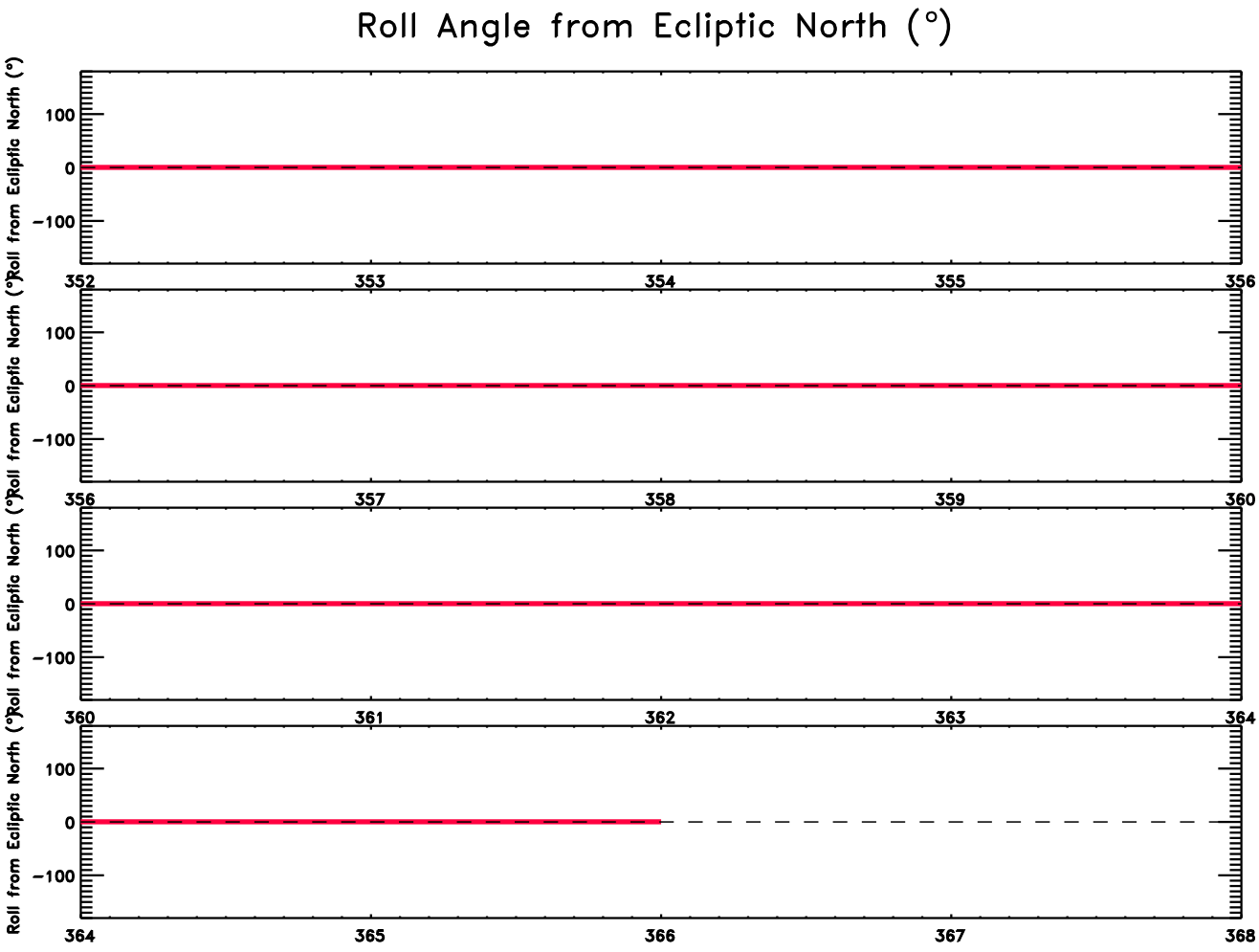
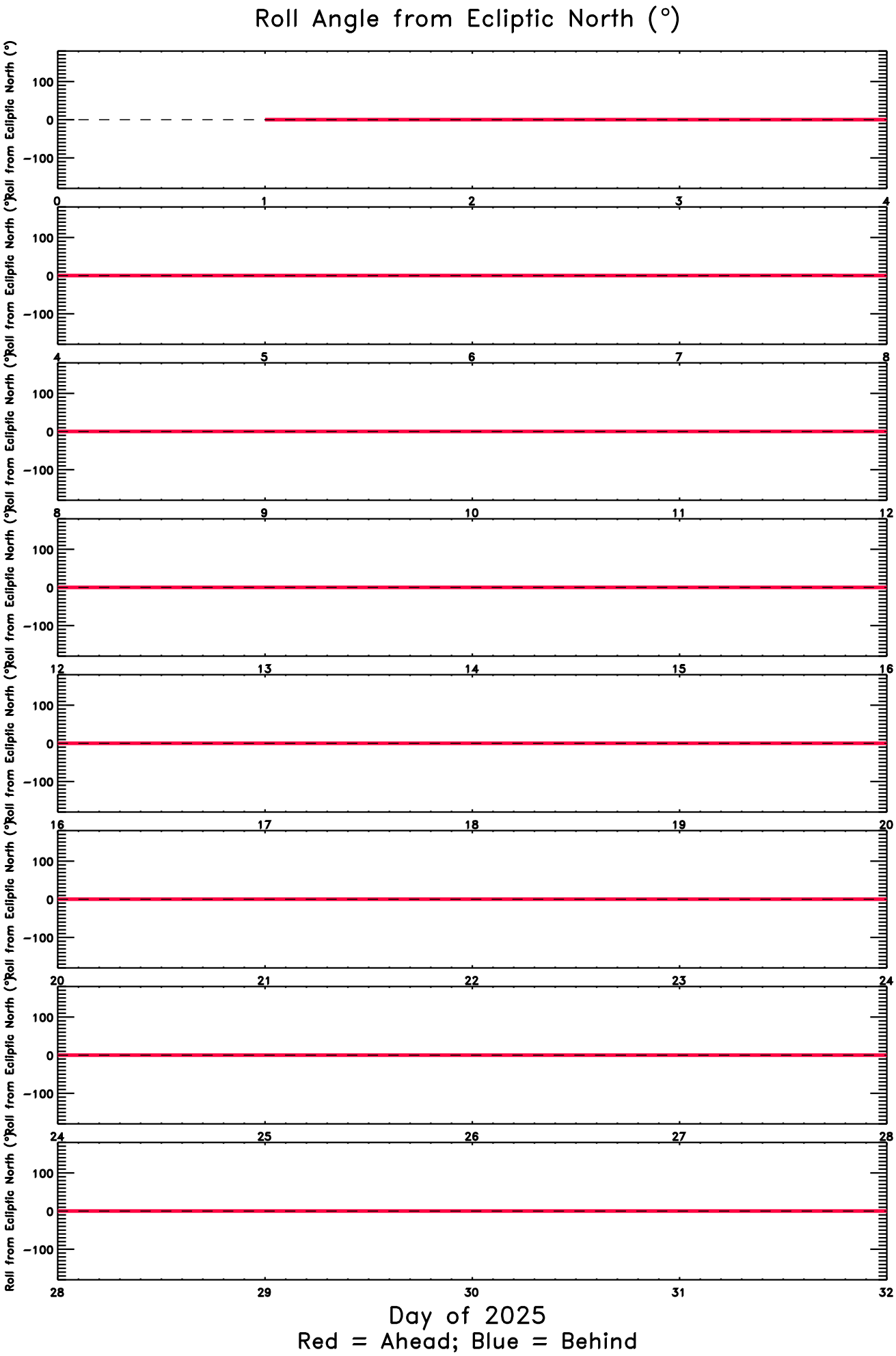
−100
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
Day of 2024
Red = Ahead; Blue = Behind



Day of 2024
Red = Ahead; Blue = Behind


Roll Angle from Ecliptic North (°)
Roll from Ecliptic North (°)
100
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−100
0
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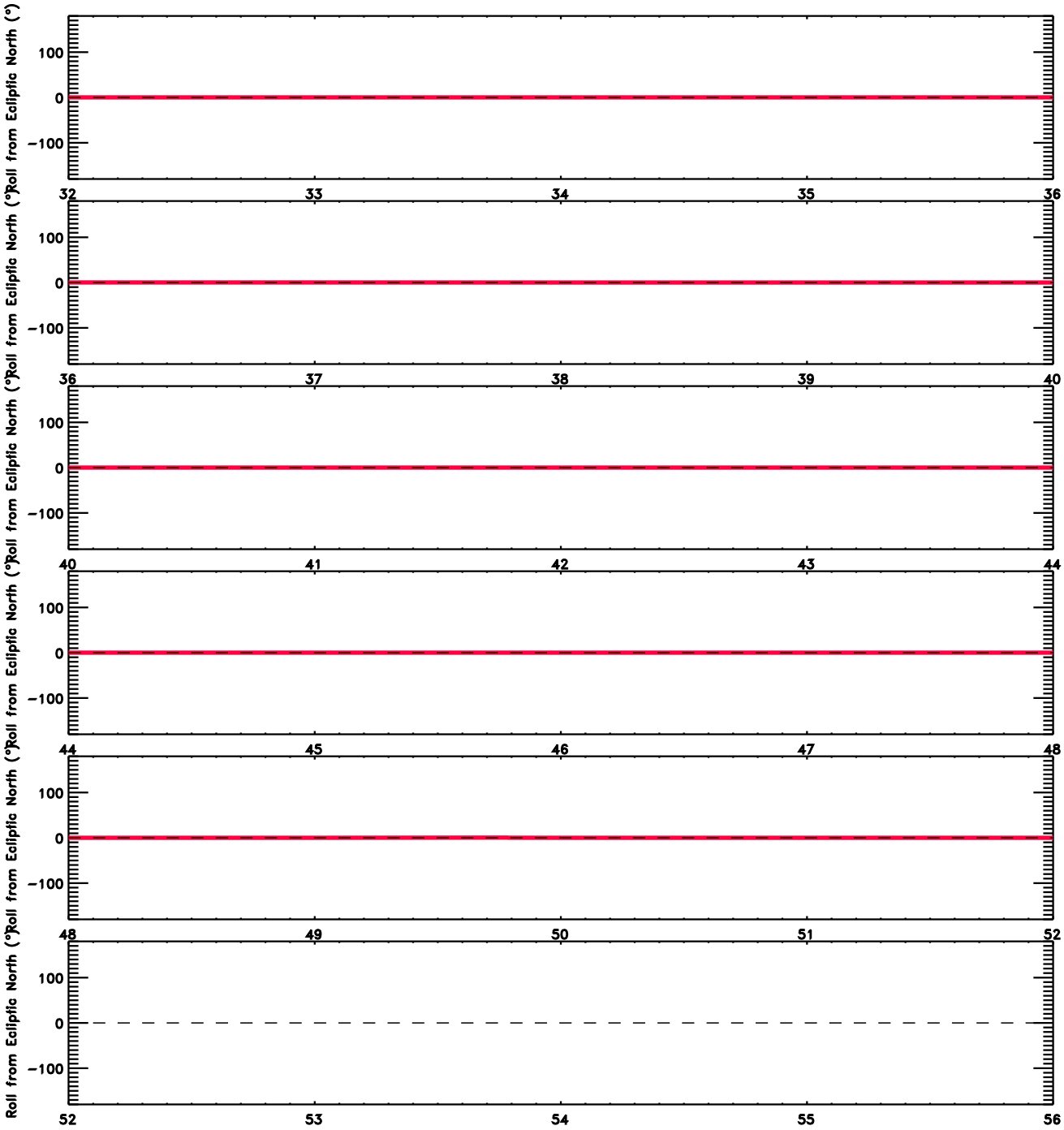
32
Day of 2025
Red = Ahead; Blue = Behind

Roll Angle from Ecliptic North (°)



Day of 2025

Red = Ahead; Blue = Behind