NEW SIS COORDINATE SYSTEM TRANSFORMATIONS

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To: CRIS/SIS Data Analysis Teams

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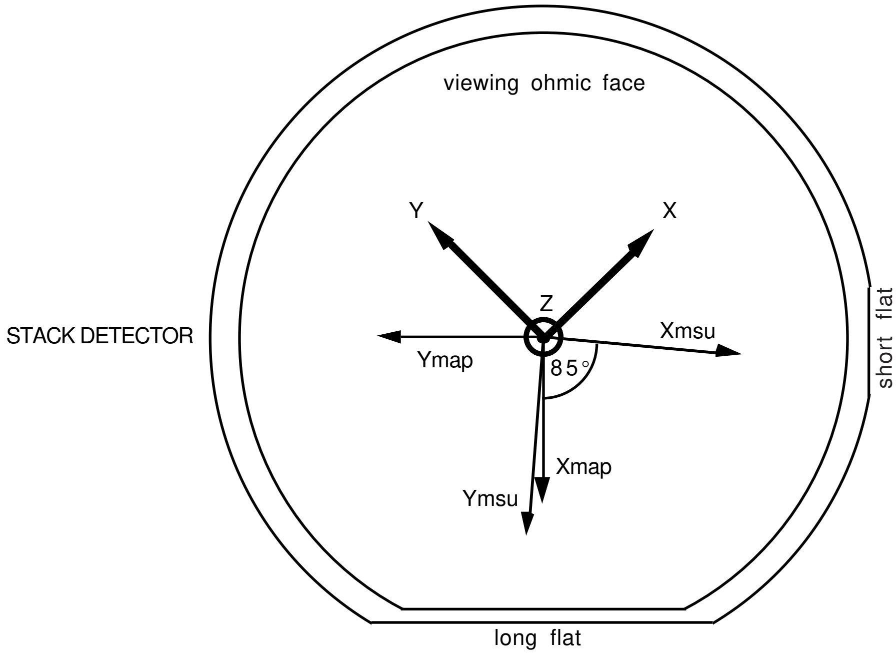
This memo announces changes to the SIS coordinate transformation conventions. We have altered the routines which return detector thicknesses at given positions. A user of these routines will now simply input positions as SIS global coordinates. The necessary transformations to thickness-map coordinates will be computed internally.

Note that the global coordinate system itself has not changed; the X, Y, and Z axes are still pointing in the same directions as before, and the origin is unmoved. Data Team members must be aware, however, that they should now ignore the (X,Y) -to- (x,y) transformations for SIS described in that long table in the “Transformations for CRIS and SIS Coordinates” memo.

To document some of the relevant coordinate systems that have gone into use for SIS, I prepared the following figures. The MSU orientations were confirmed by (1) looking at scatterplots of event positions made online during data acquistion (specifically, hardcopy that was preserved in the run-log binder for runs 41 and 134) which revealed the long flat on a stack detector and holes in the matrix detector mounts, and (2) remembering that the argon beam entered the ohmic faces of all detectors. Transformations to map-space coordinates are found in Bruce Sear’s /darkalf/bruce/ace/msu96/decon.pro IDL routine. Evidence that no mistakes were made was provided by Rick Leske, who tried different map-space orientations and found that the best calculated mass resolution for flight data was obtained with the coordinates systems shown here.

SIS coordinate systems



(X,Y,Z) are the global coordinates defined on SIS as noted in the "Transformations for CRIS and SIS Coordinates" memo.

(Xmap,Ymap) is the coordinate system used to create the thickness data bases. See Bruce's "Definition of CRIS/SIS 'BS Detector Coordinates'" memo. Note that BS coords are related to interferometry coords via (X,Y) -> (-X,-Y).

(Xmsu,Ymsu) was the coordinate system used at MSU '95, incorporating stage positions and MWPC readouts.