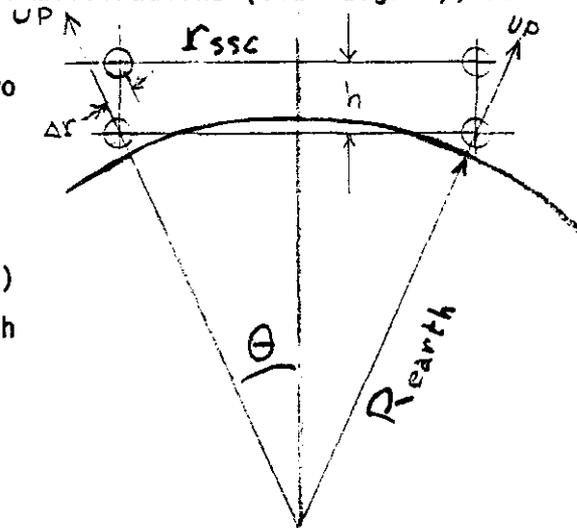


## A PLANAR SSC ON A ROUND WORLD

J.M. Peterson  
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In order that the two rings of the SSC have the same circumference, the magnetic components of the upper ring can not be directly above those of the lower ring but rather must be displaced horizontally slightly inward. Also, their magnetic axes must be tilted slightly from the local gravity direction in order to avoid horizontal-vertical coupling. These apparent offsets and tilts arise because the SSC is so large that the local gravity direction varies around the ring by as much as 4.4 milliradians (0.25 degree), relative to the plane of the SSC.

The figure shows the geometry of two identical, planar rings separated by distance  $h$  (70 cm for the SSC). The conical half-angle  $\theta = r_{SSC}/R_{earth}$  varies from 1.88 (on the east-west axis) to 2.20 milliradians (on the north-south axis). This is the angle that all the magnets must be rolled to avoid horizontal-vertical coupling in the betatron oscillations of the beam.



If the magnets are initially mounted in stands so that one is directly above the other and aligned to the common vertical axis, the correct orientations and relative positions will result if then the stands are rolled by the angle  $\theta$ . The apparent radial offset between the two rings ( $\Delta r$  in the figure) varies from 1.32 mm (on the east-west axis) to 1.54 mm (on the north-south axis).

The figures given are for the CDR configuration.

Circumference	82.9440 Km
N-S diameter	28.0438 Km
E-W diameter	23.9568 Km
$R_{earth}$ (mean of polar and equatorial radii)	6367.65 Km
$h$ = ring separation	= 0.70 m