



Figure A

(A) Solid arrows denote directions of  $ExB$  drift for electron Larmor motion ( $rL=2.1m$  for 1 keV) in axisymmetric converging potential region viewed along the magnetic field direction. There appears no residuals in  $ExB$  drift at the center due to symmetry.

(B) Same as (A) but converging potential is axially asymmetric with respect to the principal axis (direction of arc alignment). The arc is separated into six circles along the principal axis. In each circle, residuals appear perpendicular to the principal axis because of asymmetry. Those are depicted by solid arrows in red. As a result, arc alignment rotates clockwise. Thicker circle indicates electron densities are higher.