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Theory     Experiment

**Ion Orbit Loss Effect on Structure of Radial Electric Field,\***  
T.M. Wilks, W.M. Stacey, *Georgia Tech*; T.E. Evans, *General Atomics* – The radial electric field is an important factor in the L-H transition, the suppression of ELMs, etc. Therefore the modeling of the causes and the dynamics of the radial electric field in the edge and scrape off layer regions are of interest. We are investigating the interdependence of ion orbit loss, the compensating ion return current, rotation, and magnetic flux surface geometry on the radial electric field in the edge region and the coupling to the electric fields in the scrape off layer. Both thermalized plasma ions and fast beam ion losses are modeled in realistic geometry. The importance of toroidal and poloidal rotation in relating ion orbit loss to the radial electric field is examined. The ion orbit loss is modeled with conservation equations and supplemented by Lorentz orbit tracking calculations of the fraction of ions that recross the separatrix back into the edge plasma.

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