

**Abstract Submitted for the Forty-Eighth Annual Meeting  
Division of Plasma Physics  
October 30<sup>th</sup>-November 3, 2006, Philadelphia, Pennsylvania**

Category Number and Subject: 5.6.2. DIII-D Tokamak

Theory     Experiment

**Measurements of Escaping Fast Ions at the DIII-D Vessel Wall,\*** L.D. Pickering, W.W. Heidbrink, and Y. Zhu, *U. California-Irvine* – The loss of fast ions is detected by two pairs of thin foil Faraday collectors [1] that are installed just behind the graphite first wall in a vacuum port. Collimating apertures select fast ions that have energies  $>10$  keV and that travel either with or against the plasma current. The strong correlation of beam-ion loss detector (BILD) signals with neutral beam modulation shows that, under appropriate conditions, prompt losses from nearly every beam source are detected. Orbit calculations indicate that the correlation occurs when injected neutrals are deposited at a location that “connects” with an orbit observed by the detector; as expected, these correlations depend strongly on plasma current. In addition to these classical effects, enhanced signals sometimes occur during ion cyclotron heating (presumably due to parametric decay instabilities) and during Alfvén activity (due to transport by the instabilities).

[1] F.E. Cecil, et al., *Rev. Sci. Instrum.* **74**, 1747 (2003).

\*Work supported by U.S. DOE under SC-G903402 and DE-FC02-04ER54698.