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Pitch and Energy Resolved Fast Ion Losses in the DIII-D Tokamak,* D.C. Pace, W.W. Heidbrink, C.M. Muscatello, Y.B. Zhu *UCI*; R.K. Fisher, M.A. Van Zeeland *GA*; M. García-Muñoz, *MPI* —
A scintillator-based fast ion loss detector (FILD) measures the pitch and energy of energetic ions reaching the wall at approximately 45-degrees below the outer midplane. Losses are observed in connection with various instabilities, including Alfvén eigenmodes, energetic particle driven geodesic acoustic modes, and tearing modes. Orbit trajectory calculations based on FILD measurements allow for the identification of ion/mode interactions in phase space. These orbit calculations are part of the development of a synthetic FILD diagnostic that is validated against the well-understood case of neutral beam prompt losses in a specially designed DIII-D discharge. Results from the FILD across an array of plasma parameters will be presented, along with the initial design calculations and physics goals pertaining to a second FILD that will be installed near the outer midplane before the next experimental campaign.

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