Near Midplane Scintillator-Based Fast Ion Loss Detector on DIII-D

X. Chen[1], W.W. Heidbrink[1], R.K. Fisher[2], D.C. Pace[2], M.A. Van Zeeland[2], and M. García-Muñoz[3]

[1]*University of California-Irvine, Irvine, California, USA*
chenxi@fusion.gat.com, bill.heidbrink@uci.edu
[2]*General Atomics, PO Box 85608, San Diego, California 92186-5608, USA*
fisher@fusion.gat.com, pacedc@fusion.gat.com, vanzeeland@fusion.gat.com
[3]*Max-Planck Institut fur Plasmaphysiks, Garching, Germany*

A new scintillator-based Fast-Ion Loss Detector (FILD) installed near the outer midplane of the plasma has been commissioned on DIII-D during the 2011 campaign. This detector successfully measures coherent fast ion losses produced by fast-ion driven instabilities (≤500 kHz). The new FILD detector combines with the first FILD detector ~45° below the midplane [1] to provide additional information on the poloidal distribution of fast ion losses. The phase space sensitivity of the new detector (gyroradius r_L ~ [2.5,8] cm and pitch angle θ_{pitch}~[35°,85°]±3°) is calibrated using neutral beam first orbit loss measurements. Since fast ion losses are localized poloidally, having multiple FILDs at different poloidal locations allow us to study such losses over a larger range of plasma shapes and types of loss orbits.

1. R.K. Fisher, et al., *Rev. Sci. Instrum.* **81**, 10D307 (2010).

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