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Fast Particle Loss-Cone Measurements by the Novel Angular-Resolved Multi-Sightline Neutral Particle Analyzer (ARMS-NPA) on Large Helical Device. EVGENY VESHCHEV, Graduate University for Advanced Studies, Hayama, Kanagawa, 240-0193, Japan, TETSUO OZAKI, PAVEL GONCHAROV, SHIGERU SUDO, National Institute for Fusion Science, Toki, Gifu 509-5292, Japan, LHD EXPERIMENTAL TEAM — The novel diagnostic of fast particles (ARMS-NPA) based on linear AXUV detector has been successfully developed and started measurements on LHD [1]. This is the first time of using AXUV detector for fast particle measurements on plasma devices. ARMS-NPA can provide time-, angular- and energy-resolved measurements of fast particles even in short-time discharges. This diagnostic can be a powerful tool in fast particle physics and confinement studies in such a complex helical plasma geometry like the one of LHD. It can become irreplaceable instrument in the checking of fast particle loss-cones existing in helical devices which were predicted by some theoretical works [2,3] and refuted by another [4]. Measurements were made in the variety of experimental conditions and compared with theoretical simulations. [1] E.A. Veshchev, T.Ozaki, *et al.*, Rev. Sci. Instrum., **77**, 10F129-1 (2006) [2] H.Sanuki, J.Todoroki and T.Kamimura. Phys. Fluids B **2** (9), 2155 (1990) [3] M. Wakatani, *Stellarator and Heliotron Devices* (Oxford University Press, Oxford, 1998) [4] T. Watanabe *et al.*, Nucl. Fusion **46**, 291 (2006).

Evgeny Veshchev
National Institute for Fusion Science

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