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High Resolution Reflectometer Edge Density Profile Measurements at L–H Transitions and ELMs,[1] K.W. KIM, E.J. DOYLE, T.L. RHODES, W.A. PEEBLES, C.L. RETTIG, University of California, Los Angeles, N.C. LUHMANN, JR., University of California, Davis — A reliable, high resolution reflectometer density profile system has been developed on DIII–D. It utilizes broadband fast-sweep FM reflectometry with a solid-state microwave source and an active quadrupler, allowing fullband frequency sweep (33–50 GHz) down to 10 μs with high output power (20–60 mW). Fast frequency sweeps help reduce density fluctuation effects on reflectometer measurements, increasing reliability of single sweep profiles. This, in combination with optimized data analysis techniques, provides high resolution density profiles. Using this system, detailed edge profile changes during L–H transitions and ELMs have been obtained with high spatial ($\leq$ 1 cm) and temporal ($\sim$100 μs) resolution. In L–H transitions, the reflectometer has measured density profile steepening near the separatrix and profile changes in SOL during the transition. Also, significant profile changes have been observed to occur within 100 μs of ELMs. New information on the time scale of profile modification during L–H transitions and ELMs will be presented.

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