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ELM Studies on DIII-D¹ T.H. OSBORNE, A.W. LEONARD, *General Atomics*, G.D. PORTER, *Lawrence Livermore National Laboratory*, THE DIII-D TEAM, — Three classes of Edge Localized Modes, or ELMs, simply labeled Types I, II, and III, in the DIII-D work, are widely observed. Type I ELMs are distinguished by the fact that their frequency increases with increasing input power. A scaling for the Type I ELM energy loss predicts 3% for ITER. The frequency of Type III ELMs decreases with increasing input power. The energy loss per Type III ELM is a factor of 2 to 4 below that for Type I at the same input power. Experiments on DIII-D suggest that proximity to the H-mode threshold power is the critical parameter for Type III ELMs. In contrast to Type I ELMs, the pressure gradient near the separatrix at a Type III ELM is often well below the ideal ballooning mode limit. Medium n magnetic precursor oscillations are observed with Type III ELMs, while no magnetic precursors are observed with Type I ELMs. Type II ELMs have very high frequency and low energy loss compared to Type I ELMs. Type II ELMs do not require low input power in contrast to Type III ELMs. Type II ELMs are associated with edge second stability in combination with either high q or high β_P .

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