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The Relationship of Locked Modes to Edge Current in DIII-D [1] E.A. LAZARUS, Oak Ridge National Laboratory, M.S. CHU, T.H. OSBORNE, R.J. LA HAYE, General Atomics, B.W. RICE, Lawrence Livermore National Laboratory — Locked modes are a familiar problem in low density discharges [$\bar{n}_e(R_0/B_t)q^* \approx 8$] for elongated plasmas. In a series of limiter discharges we found the following phenomenology for a particular series. Discharges which were maintained at approximately constant shape during the I_p ramp encountered a locked mode at $q_\ell \approx 3$ leading to a disruptive termination with a probability of approximately 80%. Discharges for which κ was initially increased to a larger value than the desired value of 1.6 and later reduced follow a different trajectory in that $q_\ell = 3$ is not reached in the I_p ramp, but in the flattop where κ is reduced to its final value. These discharges avoided the locked mode with 100% reliability. The current density is measured with a motional Stark effect diagnostic. At the time $q = 3$ is reached, the edge current density is somewhat higher in the former cases. Experimental results and resistive stability analysis will be presented.

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☐ Prefer Oral Session
☒ Prefer Poster Session

Special instructions: DIII-D Poster Session 1, immediately following J Bialek

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