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Prompt Plasma Response to Neutral Beam Injection[1]

T.L. RHODES, C.L. RETTIG, W.A. PEEBLES, Electrical Engineering and Institute of Plasma and Fusion Research, University of California, Los Angeles, K.H. BURRELL, F.L. HINTON, General Atomics — A prompt (<10 ms) plasma response to neutral beam injection has been observed on the DIII–D tokamak. The effect is observed most readily in the Doppler shift of the turbulent fluctuation spectrum in both the edge and core plasma. The changes are large and occur much more quickly than beam-plasma equilibration times indicating a non-collisional momentum transfer mechanism. The core changes may be due to fast changes in the radial electric field E_r associated with radial trapped particle currents (Hinton and Rosenbluth, General Atomics Report GA–A22075). The effect could be important for E_r control of advanced tokamak regimes in tokamaks where a more perpendicular injection is required due to beam injection geometry. Experimental data and comparison to theory will be presented.

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