

Abstract Submitted  
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**Real Time Computer Control of Neutral Beam Energy and Current During a DIII-D Tokamak Shot.**<sup>1</sup> C.J. PAWLEY, D.C. PACE, J.M. RAUCH, J.T. SCOVILLE, General Atomics — A new control system has been implemented on DIII-D neutral beams which has been used during the 2016 and 2017 experimental campaign to directly change the beam acceleration voltage (V) and beam current (I) by the Plasma Control System (PCS) during a shot. Small changes in the beam voltage of 1-2 kV can be made in 1 msec or larger changes of up to 20kV in 0.5 seconds. The beam current can be modified by as much as 20% at a fixed beam voltage. Since both can be independently and simultaneously changed it is possible to change beam power (IV) at fixed voltage, keep constant power while sweeping beam voltage, or to maintain minimum beam divergence during a beam voltage sweep by changing I simultaneously to keep a constant beam perveance. The limitations of the variability will be presented with required changes in equipment to extend either the speed or range of the controls. Some of the effects on fast ion plasma instabilities or other plasma mode changes made possible by this control will also be presented (see also D.C. Pace, this conference).

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