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**Studies of transport and stability for optimized pulsed poloidal current drive (PPCD) operation in reversed field pinches** GIAN LUCA DELZANNO, JOHN FINN, LANL — We have combined 1D transport simulations of PPCD with linear stability studies for a spectrum of tearing and ideal MHD modes. We have specified a zero beta plasma with a fixed profile of parallel resistivity, with applied toroidal and poloidal electric fields at the edge to simulate PPCD. The first studies use a model in which the poloidal electric field and the toroidal electric field are specified as in Ref. [1]. The linear stability is monitored for modes with  $m=0$  and with  $m=1$  and a wide spectrum of  $n$ , producing linear growth rates as functions of time. In order to optimize the process, by maximizing the time over which the modes are stable, we introduce a procedure in which a global “stability factor” is minimized, holding the total toroidal current constant, and use this to determine the optimal waveforms of toroidal and poloidal electric field at the boundary. For these optimal waveforms, the stable time interval is computed and compared with the prescribed scheme discussed above. Comparisons with different stability factors are shown.

[1] J. Reynolds, PhD dissertation, University of Wisconsin, 2007.

Gian Luca Delzanno  
LANL

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