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Electrostatic Mode Locking and Mode Suppression in RFPs and Tokamaks RICHARD NEBEL, Tibbar Technologies, JOHN FINN, Los Alamos National Laboratory — It is possible to lock and amplify m=1 modes from the boundary in an RFP by using electrostatic fields. Furthermore, it is possible to do this without any magnetic field lines penetrating the boundary (i.e. the normal component of the magnetic field vanishes at the boundary). These can result in single-helicity or quasi-single-helicity states which have good flux surfaces. A key to forming these states is to drive the primary unstable RFP mode to large amplitude. For the unstable modes, perturbations from the boundary amplify into the interior. These same ideas can be applied to suppressing modes as well, such as the secondary m=1 modes in RFPs or edge modes in Tokamaks. We derive the required phasings to implement this scheme. We also present a conceptual feedback control scheme for suppressing instabilities.

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