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Momentum transport from current-driven and flow-driven instabilities in astrophysical disks S.C. PRAGER, F. EBRAHIMI, D.D. SCHNACK, Center for Magnetic-Self Organization in Laboratory and Astrophysical Plasmas, University of Wisconsin-Madison — Rapid transport of angular momentum in astrophysical disks can be explained through the stresses arising from MHD instabilities. Here, we examine momentum transport from current-driven and flow-driven instabilities in disk geometry. We perform nonlinear MHD computations both for turbulence generated by tearing modes and by flow-driven Magneto-Rotational Instability (MRI). We find that in an MRI stable disk configuration, tearing modes can grow and cause transport of momentum. The effects of disk thickness and flow magnitude in momentum transport from tearing and MRI instabilities will be shown. We also examine the saturation mechanism of flow-driven instability through analytical quasilinear theory and through nonlinear computation of a single mode in a rotating disk. We show that the generation of large-scale magnetic field through the alpha effect causes the MRI mode to saturate.

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