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Linear Analysis of Sheared Flow and Magnetic Shear in Astrophysical Jets[1] L.F. WANEX, R. PRESURA, V.I. SOTNIKOV, A. ESAULOV, University of Nevada, Reno — A linear analysis of sheared flow in MHD jets with sheared helical magnetic fields is presented. A general set of ideal MHD equations allows the investigation of current driven instabilities in jet plasmas with both magnetic and flow shear included in the equilibrium profile. These equations are integrated numerically by following the linear development in time of an initial perturbation to the plasma equilibrium. This method has shown that sheared flow and sheared magnetic fields will reduce the growth of current driven instabilities in Z - pinch plasmas.[2] Here we apply this method to plasmas with equilibrium profiles that have been used to model astrophysical jets.[3] These results will be compared with full 3D ideal MHD simulations. The stabilizing effect of sheared flow and sheared magnetic fields may contribute to astrophysical jet collimation. Laboratory experiments are proposed to verify this hypothesis. The scaling of these experiments to astrophysical jets will also be presented.

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[2]L. F. Wanex *et al.*, accepted Phys. Plasmas.
[3]S. Appl *et al.*, Astron Astrophys., 355, 818, (2000)

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