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**Saturation of Electromagnetic Flute Mode Instability in Z-pinch Plasma of a Precursor**[1] V.I. SOTNIKOV, V.V. IVANOV, T.E. COWAN, University of Nevada at Reno, NV 89557 USA, J.N. LEBOEUF, University of California at Los Angeles, CA 90095 USA, B.V. OLIVER, B.M. JONES, C. DEENEY, T.A. MEHLHORN, Sandia National Laboratories, NM 87123 USA — Linear analysis of the electromagnetic flute mode instability in the high beta current carrying plasma of the precursor, has demonstrated good agreement between theory and experimental data obtained during wire array implosion experiments on the Zebra pulsed power generator in terms of excited wavelengths and characteristic growth rates. In order to solve numerically nonlinear equations which describe saturation of the instability, we derived expressions for the possible equilibrium profiles for density and magnetic field and developed a 2D numerical code based on the pseudo-spectral method for spatial representation and the two-step predictor corrector method for time advance. In the linear stage numerical results are in good agreement with linear theory. In the nonlinear stage numerical solutions show saturation of the instability, appearance of large scale structures as well as emergence of shorter wave lengths in the excited wave spectrum. The role of large scale structures in anomalous plasma transport will be also discussed.

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