Envelope structures of coupled drift-zonal flow system in a dissipative tokamak plasma[1] ANURAJ PANWAR, CHANG-MO RYU, Department of Physics, POSTECH, Pohang, Korea 790-784, RAGHVENDRA SINGH, WCI Center for Fusion Theory, NFRI, Daejeon 305-333, South Korea — In this paper, the modulational instability and associated envelope structures of coupled drift-zonal flow system in a dissipative tokamak plasma are investigated. Dissipative non-linear Schrodinger (NLS) equation is derived by using the derivative perturbation expansion method to govern the dynamics of modulated waves. Dissipative effects due to the collisions and kinematic viscosity significantly modify the growth of modulational instability. Dissipative NLS equation admits the localized solutions in the form of drift wave envelope solitons along with shock like zonal flow structures. The height of drift wave envelope solitons and zonal flow shock structures decreases with the increase in collisional and viscous dissipation.

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