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Intrinsic Rotation and Momentum Transport in Reversed Shear Plasmas with Internal Transport Barriers HOGUN JHANG, S.S. KIM, National Fusion Research Institute, P.H. DIAMOND, NFRI, UCSD — The intrinsic rotation in fusion plasmas is believed to be generated via the residual stress without external momentum input. The physical mechanism responsible for the generation and transport of intrinsic rotation in L- and H-mode tokamak plasmas has been studied extensively. However, it is noted that the physics of intrinsic rotation generation and its relationship to the formation of internal transport barriers (ITBs) in reversed shear (RS) tokamak plasmas have not been explored in detail, which is the main subject in the present work. A global gyrofluid code TRB is used for this study. It is found that the large intrinsic rotation ($\sim$10-30% of the ion sound speed depending on ITB characteristics) is generated near the ITB region and propagates into the core. The intrinsic rotation increases linearly as the temperature gradient at ITB position increases, albeit not indefinitely. Key parameters related to the symmetry breaking, such as turbulent intensity and its gradient, the flux surface averaged parallel wavenumber are evaluated dynamically during the ITB formation. The role of reversed shear and the q-profile curvature is presented in relation to the symmetry breaking mechanism in RS plasmas.

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