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Gyrofluid Simulations of Intrinsic Rotation Generation in Reversed Shear Plasmas with Internal Transport Barriers HOGUN JHANG, S.S. KIM, J.M. KWON, L. TERZOLO, J.Y. KIM, National Fusion Research Institute, P.H. DIAMOND, University of California, San Diego — It is accepted that the intrinsic rotation is generated via the residual stress, which is non-diffusive components of the turbulent Reynolds stress, without external momentum input. The physics leading to the onset of intrinsic rotation in L- and H- mode plasmas have been elucidated elsewhere. However, the physics responsible for the generation and transport of the intrinsic rotation and its relationship to the formation of internal transport barriers (ITBs) in reversed shear (RS) plasmas have not been explored in detail, which is the main subject in the present work. The revised version of the global gyrofluid code TRB is used for this study. It is found that the large intrinsic rotation (∼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. In particular, the role of reversed shear and the q-profile curvature is presented in relation to the symmetry breaking in RS plasmas.

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