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The zonal flow back-reaction on ion-temperature-gradient mode turbulence JOHAN ANDERSON, EUN-JIN KIM, Sheffield University, JIQUAN LI, YASUAKI KISHIMOTO, Kyoto University — Anomalous transport remains one of the main concerns in magnetically confined plasmas. The anomalous transport in the core is commonly attributed to Ion-Temperature-Gradient (ITG) mode turbulence. There is strong evidence indicating zonal flow suppression of the Ion-Temperature-Gradient (ITG) mode turbulence, specifically close to the linear $\eta_i = L_n/L_{Ti}$ threshold. A critical concept is the transport regulation and transport barrier formation by zonal flows. The present study reports on the effects of zonal flow suppression of the ITG turbulence, suggesting an increase in the effective linear ITG threshold. This is also known as the Dimit's shift. While, the zonal flows are generated from ITG background turbulence by the coherent mode coupling, moreover the zonal flow back-reacts on the ITG mode turbulence resulting in a modified linear ITG mode threshold. It is shown that the short wave length zonal flow suppression of drift wave turbulence is significant, particularly close to the threshold (η_{ith}).

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