

The Configuration Dependence of Isotope Effects on Turbulence System in Heliotron J

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The hydrogen/deuterium (H/D) isotope effects on fluctuations and its configuration dependence are studied in a helical device, Heliotron J. The isotope dependence of a toroidally symmetric fluctuation in low frequency range of $< \sim 4\text{kHz}$, which is considered as a zonal flow, is observed in low-density ECH plasmas in Heliotron J. The long-range toroidal correlation of the low frequency range become higher on D dominant plasmas in standard configuration of Heliotron J. Interestingly, however, different dependence on isotope ratios, smaller amplitude and coherence in the frequency range, is observed in D plasmas in the magnetic configuration with low-bumpiness. The configuration dependence can be one of factors to explain the difference in isotope effect between tokamaks and helical devices.

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