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Gyrokinetic electromagnetic isotope effect in ITER-hybrid plasmas and validation TOBIAS GOERLER, Max Planck Institute for Plasma Physics, Boltzmannstr. 2, 85748 Garching, Germany, JERONIMO GARCIA, CEA, IRFM, F-13108 Saint-Paul-lez-Durance, France, FRANK JENKO, Department of Physics and Astronomy, University of California, Los Angeles, California 90095, USA — A number of high-realism simulations with the gyrokinetic turbulence code GENE have been performed recently for comparison with experimental measurements in, e.g., ASDEX Upgrade and DIII-D. Some of these successful validation studies will be reviewed briefly as basis for subsequent predictive simulations for a particular ITER hybrid scenario [K.Besseghir et al., PPCF 55, 125012 (2013)]. Here, comprehensive local GENE simulations have been employed considering the multi-component character of such plasmas including impurities, fuel ions, helium ash, up to two fast ion species as well as electromagnetic fluctuations, inter- and intra-species collisions, and external shear effects. The fluxes are in general in good agreement with those in the above ITER study performed with the CRONOS code suite. A particular subject of interest is the turbulent transport comparison between deuterium-tritium (DT) plasmas and pure deuterium (DD) fuel as mostly used in present-day experiments. Here, a strong heat flux drop from DD to DT plasmas can be observed which is in line with experimental evidence found at TFTR and JET. This contribution may hence help to gain a better understanding of this so-called isotope effect and improve projections for future ITER DD- and DT-plasma studies.

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