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Hybrid simulation of fast ion dynamics in the presence of off-axis fishbone-like modes in high-beta JT-60U plasmas[1] ANDREAS BIERWAGE, NOBUYUKI AIBA, GO MATSUNAGA, KOJI SHINOHARA, JAEA, YASUSHI TODO, NIFS, MASATOSHI YAGI, JAEA — The MHD-PIC hybrid code MEGA is used to simulate high-beta JT-60U plasmas in regimes near marginal MHD ballooning stability and driven by neutral beams. The goal of this research is to study the transport of fast ions caused by experimentally observed fishbone-like modes that peak off-axis (near the q=2 surface) and have frequencies well below the accumulation points of the beta-induced gap of the shear Alfvén continuum. The approach chosen is as follows. Before examining the physics via parameter scans and case studies, the relevance of the simulation model is verified by checking whether the code can reproduce a plasma response with properties similar to those seen in the experiments. For this purpose, the simulation scenario is set up as realistically as currently possible: with realistic plasma shape and bulk pressure, and a fast ion distribution that is consistent with particle sources and collisions. The methods used and first results are reported and discussed.

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