Abstract Submitted
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Development of weight functions for 3 MeV proton diagnostics in FIDASIM[1] ALVIN GARCIA, WILLIAM HEIDBRINK, University of California, Irvine, WERNER BOEGLIN, ALEXANDER NETEPENKO, Florida International University, MIRKO SALEWSKI, Denmark Technical University, LUKE STAGNER, General Atomics — The weight function of a diagnostic is important in Energetic Particle research. It describes the phase space sensitivity of a diagnostic that is used in forward modelling and tomographic reconstructions of the fast-ion distribution function. The challenges of the weight function calculation for a 3 MeV proton diagnostic are attributed to the curved "sightline" trajectories, which are dependent upon the proton velocity. For example, curves must be considered in the calculation of the detector solid angle accepted by the collimating structure. At MAST, the charged fusion product diagnostic (CFPD) measures 3 MeV protons from beam-target fusion reactions between fast ions and thermal deuterium in the plasma core. In an effort to simulate energy-resolved proton signals and use CFPD data for tomographic inversions, the weight function of a 3 MeV proton diagnostic is developed. This poster discusses the implementation of the algorithm in the FIDASIM framework and its benchmark against existing independent calculations at MAST.

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