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Theory Experiment

Fast Ion Effects During Test Blanket Module Simulation Experiments in DIII-D,* G.J. Kramer, R. Budny, R. Nazikian, *PPPL*; W.W. Heidbrink, *UC-Irvine*; T. Kurki-Suonio, A. Salmi, *Helsinki U.*; M.J. Schaffer, M.A. Van Zeeland, *GA*; K. Shinohara, *JAEA*; J.A. Snipes. *ITER Org.*; D. Spong, *ORNL* – The fast beam-ion confinement in the presence of a scaled mock-up of two Test Blanket Modules (TBM) for ITER was studied in DIII-D. The TBM on DIII-D has four vertically arranged protective carbon tiles with thermocouples placed at the back of each tile. Temperature increases of up to 200°C were measured for the two tiles closest to the midplane when the TBM fields were present. These measurements agree qualitatively with results from the full orbit-following beam-ion code, SPIRAL, that predict beam-ion losses to be localized on the central two carbon tiles when the TBM fields present. Within the experimental uncertainties no significant change in the fast-ion population was found in the core of these plasmas which is consistent with SPIRAL analysis. These experiments indicate that the TBM fields don't affect the fast-ion confinement in a harmful way which is good news for ITER.

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