Abstract Submitted
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Automating Interpretive Edge Transport Modeling on DIII-D with UEDGE[1] ZICHUAN XING, A. O. NELSON, O. IZACARD, Princeton University, M.E. AUSTIN, A. MARINONI, Massachusetts Institute of Technology, A. JARVINEN, M. UMANSKY, Lawrence Livermore National Laboratory, E. KOLEMEN, Princeton University — DIII-D discharges are analyzed with automatic interpretive UEDGE modeling to determine transport profiles in the pedestal and scrape-off layer (SOL). This new workflow enables automatic interpretive UEDGE simulations that match observed temperature and density profiles, given flux boundary conditions and neutral density constraint. Understanding of edge and SOL transport analysis is key for meeting the challenges of a practical fusion reactor, but fluid simulations of the SOL have been hereto time consuming to obtain. Using the OMFIT framework to combine UEDGE with recently developed automatic grid generators and the CAKE automatic kinetic equilibrium reconstruction workflow has allowed the batch analysis of a much larger number of shots and time slices than was previously practical. This automatic workflow has been used to produce scans both from experimental and hypothetical profiles in order to evaluate sensitivities to model parameters. The results show qualitative agreement on detachment and ELM cycle divertor density evolution, but differs from experiment on the quantitative values, such divertor plate density or the density and temperature condition at which plasma detachment occurs. These discrepancies are explored in order to refine modeling parameters.]

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