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[X] Theory [ ] Experiment

Time-Dependent DIII-D Heat Transport Simulations Using Neural-Network Models,* J.M. Penna, *MIT*; S.P. Smith, *General Atomics*; O. Meneghini, *ORAU*; C.J, Luna, *ASU* – The neural network transport model BRAINFUSE has been developed to produce transport fluxes based on local parameters [1]. The BRAINFUSE model has been integrated into the transport modeling framework ONETWO [2,3] in order to develop time dependent solutions and has been validated by artificially varying the input neutral beam power and comparing the output to DIII-D scans. These efforts have led to the development of a time-dependent workflow within the OMFIT integrated modeling framework. The new work flow can evolve the electron and ion temperatures as a function of time dependent sources and equilibria. The effects of different engineering parameters can be explored and optimized in support of DIII-D operations. The efficiency of this workflow enables planning plasma operations of next-day experiments, as will be required for ITER.

[1] O. Meneghini *et al*., Phys. Plasmas **21**. 060702 (2014).
[2] W.W. Pfeiffer *et al*., General Atomics Report GA-A16178 (2980).
[3] O. Meneghini *et al*., Bull. Am. Phys. Soc. **58**, 109 (2014).

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