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Integral parallel heat flux closure applied in SSPX transport simulations and closing the kinetic equation[1] J.-Y. JI, E.D. HELD, Utah State University, C.R. SOVINEC, University of Wisconsin-Madison — Recent SSPX simulation with the NIMROD code[2] reveals a discrepancy in temperatures between the simulation and the experiment. The discrepancy may be due to adopting the collisional Braginskii closure despite the existence of low-collisionality regime over a large region of the plasma. In this work the integral heat flux closure based on the pitch-angle scattering operator[3] is applied in place of the Braginskii closure. Initial application of this integral closure with limited integration along field lines increases core temperatures by tens of eV's, yielding more consistency with experimental observations. Improvements to the derivation of general closures will also be discussed. The general moment equations with the full linearized collision operator will be introduced for a more rigorous treatment of the collision operator and from which a general scheme for closing the kinetic equation will be presented.

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[2]C. R. Sovinec *et al.*, Phys. Rev. Lett. **94**, 035003 (2005).
[3]E. D. Held *et al.*, Phys. Plasmas **8**, 1171 (2001).

J.-Y. Ji
Utah State University

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