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Neoclassical study of temperature anisotropy in NSTX experiments using the GTC-NEO particle code DAVID PERKINS, Brigham Young University- Provo, STEPHANE ETHIER, WEIXING WANG, Princeton Plasma Physics Laboratory — It is well-known that the level of ion transport in the National Spherical Torus eXperiment (NSTX) is close to the neoclassical level. This makes self-consistent neoclassical simulations carried out with the GTC-NEO particle code highly relevant for studying transport-related issues in NSTX. GTC-NEO, which now treats multiple species of ion impurities [1], takes as input the experimental profiles from NSTX discharges and calculates the fully non-local, self-consistent neoclassical fluxes and radial electric field. One unanswered question related to NSTX plasmas is that of possible ion temperature anisotropy, which cannot be determined experimentally with the current diagnostics. This work describes new numerical diagnostics and computational improvements that were implemented in GTC-NEO to enable the study of temperature anisotropy.

[1] R.A. Kolesnikov et al., Phy. Plasmas 17, 022506 (2010)

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