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**Neoclassical study of temperature anisotropy in NSTX experiments using the GTC-NEO particle code** DAVID PERKINS, Brigham Young University, STEPHANE ETHIER, WEIXING WANG, Princeton Plasma Physics Laboratory — Ion thermal transport in the National Spherical Torus eXperiment (NSTX) is often observed to be 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 fully non-local, self-consistent neoclassical fluxes and radial electric field. Given that the fraction of trapped particles is high in spherical tokamaks, one remarkable question is that of possible temperature anisotropy, which cannot be determined experimentally with the current diagnostics. Some experimental measurements assume the temperature anisotropy for the interpolation of raw data from diagnostics. This work describes new numerical diagnostics and computational improvements that were implemented in GTC-NEO to enable the study of temperature anisotropy.

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