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Effects of Strong Photospheric Dissipation on Accretion Disks with Nonzero Inner Torque[1] LWENDO MWANSA, Univ of San Diego, NOAH EGGER, San Diego State University, TED DEZEN, University of San Diego — We present numerical calculations of spectra and structure of accretion disks models appropriate for near-Eddington luminosity black hole X-ray binaries (BHB). Our work incorporates non-zero torque at the ISCO as well as several dissipation profiles based on first-principles three-dimensional disk interior simulations. We found that significant dissipation near the photosphere can produce steep power law-like spectra for models with moderate viewing angles spanning a range of black hole spins while including inner torque push the spectral peak to higher energies. Consistent with previous studies, we also conclude that disks with stresses at the inner edge remain viable models for high-frequency quasi-periodic oscillations (HFQPO), especially given that increasing dissipation near the photospheres actually resulted in QPO power spectra with higher quality factors compared to those found in recent work.

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