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X-ray Reverberation and X-ray Polarization: reconciling contradictory views of the corona

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The geometry of the corona in accreting black hole binaries remains a central puzzle in high-energy astrophysics, particularly during their outburst phases when dramatic structural changes occur. Two powerful observational tools available—X-ray reverberation mapping and X-ray polarization—now offer complementary but seemingly conflicting insights into the innermost regions around black holes. While reverberation studies suggest a vertically extended corona close to the black hole, recent polarization measurements point toward an horizontally extended corona structure. In this talk, I will present the recent IXPE polarization detection of GX 339-4 and place it in the broader context of polarization measurements of stellar-mass black holes. I will discuss the apparent inconsistency between polarization and reverberation results, and explore the implications for our understanding of the physical and geometric configuration of the corona. How can we reconcile these observables, and what might this tension reveal about the complexity of black hole accretion physics?

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