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Misaligned circum-single disks embedded in an AGN disk

The LIGO/Virgo detections showed unexpected progenitor black hole masses (˜66 solar mass). Such black holes with their mass falling in the pair instability mass-gap region seek a new formation channel. We focus on the so-called AGN channel to understand such a puzzling progenitor mass. In this study, we numerically model 3D global MHD accretion flows of embedded black holes within a turbulent AGN disk. The turbulent AGN disk material starts to accrete into newly borned stellar mass black holes and forms randomly aligned accretion disk structures (circum-single disks). In this talk, I will show preliminary results of what causes such a misalignment and how this could affect the evolution of the accretion disk and eventually the spin parameter of the black hole.

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