Contribution ID: **46** Type: **E-Poster Presentation**

Accretion flows in the wind-fed black holes

Sunday, 25 June 2023 17:35 (2 minutes)

The hot wind captured by the black hole can naturally form an advection dominated accretion flow (ADAF), which, as it flows toward the black hole, partially condensates into a cold disk as a consequence of efficient radiative cooling at small distances, and then accretes to the black hole via a disk-corona configuration. We present our detailed study of such accretion flows possibly exist in high-mass black hole X-ray binaries or active galactic nuclei. We find that the hot accretion flow remains as an ADAF at all distances at low accretion rates, however, it changes to a corona lying above a weak thin disk in the innermost region when the accretion rate supplied by the wind exceeds a critical value, $\dot{m}\sim0.02$. The overall spectra are typical hard-state spectra, hardening with the increase of accretion rate until an upper limit of 0.05 (corresponds to 0.03 Eddington luminosity). We demonstrate that such accretion flows reproduce the observed spectrum of Cygnus X-1 in the hard state. The presence of a weak disk around ISCO offers an interpretation to the broad Fe Kα line in the hard state. A disk-dominated soft state is anticipated at high accretion rates in the frame of such a condensation scenario.

Primary author: Mr WANG, Yilong (National Astronomical Observatories, Chinese Academy of Sciences)

Presenter: Mr WANG, Yilong (National Astronomical Observatories, Chinese Academy of Sciences)

Session Classification: Flash Talks