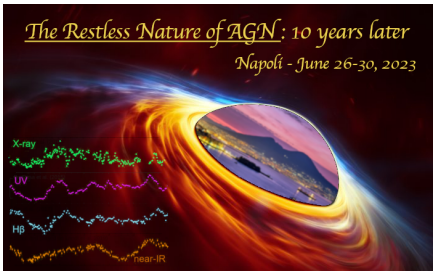

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Time Dependent Line Driven Disc Winds - X-ray Irradiation

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Line driving is a promising explanation for AGN winds as it provides both a launching mechanism and an explanation for the absorption and emission lines in spectra. As the community moves towards multi-wavelength and multi-epoch observations, our modelling of AGN systems must likewise follow suit to leverage these new capabilities. For line driving to be a viable acceleration mechanism two conditions must exist in the wind 1) The gas must be sufficiently, though not overly, ionized by X-rays, so that the gas can interact with the UV 2) The UV flux incident on the gas must be high enough to transfer sufficient momentum to overcome gravity. We present novel simulations of AGN disc winds using time-dependent, multi-frequency radiation hydrodynamics focusing on the problem of gas ionization, where we model both the X-ray and UV radiation fields. We consider a suit of models for gas/X-ray interactions and identify the conditions on scattering and absorption opacities where wind self-shielding can operate and allows line driving to launch winds.

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