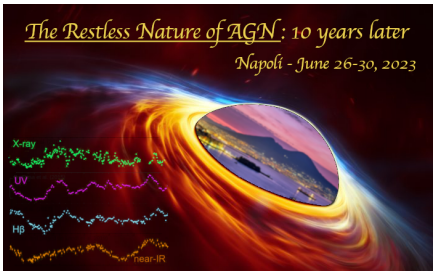

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Modified models of radiation pressure instability as a potential cause of Changing-Look AGN phenomenon

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Apart from regular, low-level stochastic variability, some AGNs occasionally show exceptionally large changes in luminosity, spectral shape, and/or X-ray absorption. The most notable are the changes of the spectral type when the source classified as a Seyfert 1 becomes a Seyfert 2 galaxy or vice versa. Thus a name was coined as 'Changing-Look AGN' (CL AGN). The origin of this phenomenon is still unknown, but for most of the sources, there are strong arguments in favor of intrinsic changes.

Understanding the nature of such rapid changes is a challenge to the models of black hole accretion flows since the timescales of the changes are much shorter than the standard disk viscous timescale, related to changes in angular momentum distribution. We aim to model the CL AGN phenomenon using the time-dependent evolution of a black hole accretion disk unstable due to the dominant radiation pressure. We use a 1-dimensional, vertically integrated scheme, and focus on the variability timescales and amplitudes, which can be regulated by the action of large-scale toroidal magnetic fields and the presence of an inner optically thin flow, like Advection-Dominated Accretion Flow (ADAF). We thus modify the inner boundary condition of the cold disk flow, and we mimic the formation of the MRI-inactive zones, that suppress instabilities, by parameterizing their relative importance according to a local accretion rate. We succeed to model the timescales of tens of years that correspond to timescales of observed repetitive outbursts in CL AGN, such as NGC 1566 or NGC 4151. However, other interpretations of quasar variability are still open and most probably more than one mechanism is responsible for changes observed in CL AGN.

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