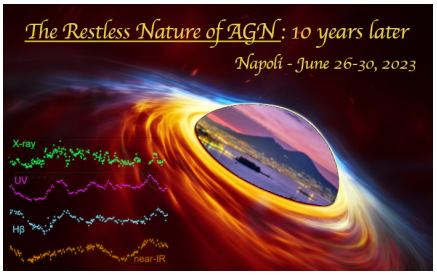

Contribution ID : **127** Type : **Contributed talk**

Ensemble Power Spectral Density of AGN in optical bands

Tuesday, 27 June 2023 15:30 (15)

Variability of AGN in all wavelengths has been known for decades, with timescales ranging from days to years. However, the physical mechanisms driving such variability are still unclear. X-ray Power Spectral Densities (PSDs) are usually well represented by power laws with slopes α ˜ -1 at low frequencies, and α ˜ -2 at high frequencies. Similar power-law trends have also been observed in UV/optical bands, but with a much lower break frequency. Optical variability is typically studied through Structure Function (SF) and modeled with a Damped Random Walk (DRW), implying a PSD with slopes at low and high frequencies, α=0, α=-2, respectively. Despite the good agreement of the DRW model on timescales from several months to a few years, many works show significant deviations on both longer and shorter timescales, along with strong uncertainties in determining the position of the break.

I will present a completely model independent study of AGN optical variability through ensemble PSD analysis on archival data. The wealth of information about bolometric luminosities and black hole masses enable the study of correlations between the variability amplitude and the AGN physical properties. PSD also has the advantage that its estimates at different frequencies are uncorrelated and with well known statistical properties. Moreover, as X-ray variability is usually studied through PSDs, using the same tool for optical bands provides better constraints on different variability models. Results from this analysis will be further boosted by the upcoming Legacy Survey of Space and Time (LSST), which will increase both the size of the sample and the temporal baseline, compared to previous surveys.

Primary author(s) : PETRECCA, Vincenzo (Università di Napoli Federico II)

Co-author(s) : PAOLILLO, MAURIZIO (Università di Napoli Federico II); PAPADAKIS, Iossif

Presenter(s) : PETRECCA, Vincenzo (Università di Napoli Federico II)

Session Classification : UV/Optical/IR Continuum variability