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Exploring AGN variability in the hardest X-rays with NuSTAR

We present here the study of the hot comptonising corona in AGN through a spectroscopic and variability analysis in the hard X-ray band (3-79 keV) with NuSTAR. We studied a flux-limited sample of 21 AGN, we investigated their coronal physical properties, such as temperature and optical depth, and their dependence from the black hole mass and the Eddington ratio, considering two possible geometries. Using NuSTAR light curves we explored the AGN variability on time scales from 1ks to 10ks, by means of the excess variance evaluated in different energy bands. This study allowed us to explore the X-ray variability of AGN through NuSTAR hard X-ray light curves, and for the first time the relationship between the variability and the coronal parameters. Finally we show how spectro-polarimetry measurements available with the proposed mission enhanced X-ray Timing and Polarimetry mission (eXTP) will shed light on the geometry of AGN coronae.

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