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The X-ray/UV luminosities relation in high-redshift quasars

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A tight non-linear relation between the X-ray and optical-ultraviolet emission has been observed in unobscured Active Galactic Nuclei (AGN) over several orders of magnitude in luminosity and irrespective of the sample selection, suggesting a universal coupling between the disk, emitting the primary radiation in the UV band, and the hot corona emitting in the X-ray.
Recently, our group developed a method to use the non-linearity of the relation to estimate the absolute luminosity of quasars, turning them into standardizable candles.
In this regard, we investigated the presence of potential systematics of this correlation at high redshift; studying the $L_{\rm X} - L_{\rm UV}$ relation for a sample of 55 $z > 4$ quasars, selected on the basis of their spectral properties and the quality of the available observations in both X-ray and optical/UV bands.
We found that the relation shows no-evidence for evolution with redshift, implying that the physical mechanism regulating the energy transfer between the accretion disc and the X-ray emitting corona has to be ubiquitous, hence allowing the use of quasars in observational cosmology.

Topic

Active Galactic Nuclei: accretion physics and evolution across cosmic time

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