

An X-ray view of the ambiguous nuclear transient AT2019pev

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Active galactic nuclei (AGN) can exhibit drastic changes that differ significantly from the normal stochastic variability, such as changing-look AGN and rapid-turn on events. Transients also occur in quiescent supermassive black hole (SMBH). When it tidally disrupts a passing star, about half of the debris can be accreted to produce a luminous flare in a tidal disruption event (TDE). It is non-trivial to observationally distinguish TDEs from AGN transients. In particular, transient surveys have discovered “ambiguous nuclear transients (ANTs)” that can be classified as neither TDEs nor AGN. Unveiling the nature of these ANTs is critical for understanding of the extreme accretion episodes in SMBHs. I will present an extensive X-ray study with Swift, Chandra and NICER over 173 days for the ambiguous nuclear transient AT2019pev that showed features of both TDEs and AGN. Most X-ray properties of this transient more closely resemble an AGN. However, the X-ray spectra show a “harder-when-brighter” trend before the X-ray lightcurve peak, while the trend is inverted after the peak. This change could indicate a transition of accretion state, which is not commonly observed for both TDEs and AGN.

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