X-RAY ASTRONOMY 2019
Current Challenges and New Frontiers in the Next Decade
8-13 September 2019
CNR/INAF Research Area, Bologna, Italy

Contribution ID: **271** Type: **Poster**

A tidal disruption event in an AGN

Friday, 13 September 2019 14:14 (2 minutes)

We report the the discovery of a Tidal Disruption Event (TDE) occurred in the Active Galactic Nuclei. The X-ray spectral properties and the broad optical emission lines detected in the SDSS spectrum clearly revealed the AGN nature, with black hole mass of $\sim 10^6\ M_\odot$ and Eddington ratio of $\lambda_{Edd} = 0.6$. A sudden increase in flux during the second half of 2009 is shown in the long-term optical, UV and NIR light curves. After an initial decline, a plateau phase evidently emerged in the NUV and optical \textit{u, g, r, i} light curves. The plateau phase in the NUV band is likely lagged behind the optical ones by approximately 70–80\,days with also a much shorter duration, i.e. ∼7–15\,days against ∼40–50\,days. The long-term light curves in the NUV and optical bands (after the plateau phase), as well as in the infrared band (\mission{VISTA} NIR and \mission{WISE} MIR), can be well fitted with a power-law with the form $f(t) = A * (t - t_0)^{-\beta}$. The value of β depends on the wavelength band, with β ∼0.7–1.0 in the NUV/optical bands, ∼2.1–2.7 in the NIR \textit{J, H, K_S} bands, and ∼1.2–1.4 in the MIR bands. The characteristics of the long-term multi-band light curves suggest that the observed increase in multi-band flux are caused by a TDE. The difference in the β value for different bands may indicate that the radiation in the optical/UV, MIR and NIR are from distinct regions which is in agreement with the scenario that the NIR and MIR flares are the echoes of the primary optical/UV emission. The lag between the NUV and optical plateau phase and the duration of the plateau phases, may imply that the optical/NUV flares are originated from the accretion disc. {\color{orange}The plateau phase can be due to viscosity decay after the stellar debris interacting with the accretion disc of AGN, while the lag can be explained with the viscosity time-scale.}

Topic

Multi-messenger and transient astronomy

Affiliation

National Astronomical Observatories, Chinese Academy of Sciences

Primary author: Dr LIU, Zhu (National Astronomical Observatories, Chinese Academy of Sciences)

Presenter: Dr LIU, Zhu (National Astronomical Observatories, Chinese Academy of Sciences)

Session Classification: POSTER SESSION