

Broadband study of BL Lac during flare of 2020: Spectral evolution and emergence of HBL component

BL Lacertae (BL Lac) is categorized as TeV blazar and considered as a possible source of astrophysical neutrinos. In 2020, the brightest X-ray flare ever detected from it. A detailed study can answer many puzzling questions related to multiband emissions and fast-flux variability often seen in this kind of source. We found that the source has crossed all its previous limits of flux and reached the maximum ever seen from it in optical and X-rays. It is highly variable in X-rays with fractional variability above 100% (1.8397 ± 0.0181) and the fastest variability time of 11.28 hours within a day. The broadband light curves correlation with X-ray suggests a time lag of one day. A broadband SED modeling is pursued to understand the possible physical mechanisms responsible for broadband emission. Modeling requires two emission regions located at two different sites to explain the low and high flux states. A significant spectral change is observed in the optical-UV and X-ray spectrum during the high state, which eventually leads to shifts in the location of the synchrotron peak towards higher energy, suggesting an emergence of a new HBL component.

Primary author: PRINCE, Raj (Center for Theoretical Physics, Warsaw, Poland)

Presenter: PRINCE, Raj (Center for Theoretical Physics, Warsaw, Poland)

Session Classification: Contributed posters