S08a **Mass Loading Efficiency and Particle Acceleration Efficiency of Relativistic Jets: Cases For Low Luminosity BL Lacs**

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Relativistic jets launched by supermassive black holes, so-called as active galactic nuclei (AGNs), are known as the most energetic particle accelerators in the universe. However, the baryon mass loading efficiency onto the jets from the accretion flows and the particle acceleration efficiency in the jets have been veiled in mystery. With the latest data sets, we perform multi-wavelength spectral analysis of quiescent spectra of 13 TeV gamma-ray detected high-frequency-peaked BL Lacs (HBLs), which are nearby low power AGN jets, following one-zone static synchrotron-self-Compton (SSC) model. We determine the minimum, cooling break, and maximum electron Lorentz factors following the diffusive shock acceleration (DSA) theory. In the talk, we will report our analysis results on the magnetization and the radiative efficiency of the jets. We also report the relation between the accretion and the jet of the HBL populations. Furthermore, we also investigated the particle acceleration efficiency of low power AGN jets in the blazar zone by including the most recent *Swift*/BAT hard X-ray spectral data. We found that our HBL samples ubiquitously have the particle acceleration efficiency of $\eta_g \sim 10^{4.5}$, which is inefficient to accelerate particles up to the ultra-high-energy-cosmic-ray (UHECR) regime in the jets. This implies that the UHECR acceleration sites should be other than the blazar zones of quiescent low power AGN jets, if one assumes the one-zone SSC model based on the DSA theory. (arXiv:1603.07623)