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Characterizing the VHE emission of the extreme HBLs 1ES 1218+304 and 1ES 0229+200 with VERITAS

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The modelling of the spectral energy distribution (SED) of some high-frequency peaked BL Lac objects (HBLs) has proved challenging for the so-called extreme candidates, which can have their TeV peak at energies > 1 TeV and a hard intrinsic TeV spectrum of $\Gamma < 2$. The HBLs 1ES 1218+304 (z = 0.182) and 1ES 0229+200 (z = 0.1396) are two characteristic examples. Historically, leptonic one-zone synchrotron self-Compton (SSC) models have been used when modelling the broadband SED of BL Lac objects with relative success, but they fail to fully describe the emission of their extreme counterparts without requiring unexpectedly large or small physical quantities, or reaching far beyond the equipartition condition, when accounting for extragalactic background light (EBL).

In this work, using archival VERITAS data from 2008 to 2021 on 1ES 1218+304 and 1ES 0229+200 combined with data from the *Swift*-XRT and *Fermi*-LAT observatories for extended wavelength coverage, we provide an updated look on the modelling of extreme HBLs.

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