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Multiwavelength modeling results of two flaring states of the distant HBL 1ES 0647+250

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1ES 0647+250 is a seemingly distant high-frequency-peaked BL Lac (HBL) object. Its redshift is uncertain but a recent 2023 estimate from the MAGIC Collaboration places 1ES 0647+250 at a redshift of 0.45 +/−0.05, which is in agreement with most estimates and lower limits in the literature. A spectrum taken with the Keck Echellette Spectrograph and Imager on 2022/12/24 shows no spectral lines from the host galaxy. According to TeVCat, adopting a redshift of 0.45 would place 1ES 0647+250 among the most distant HBLs observed at TeV energies. Two VHE flares were observed with the Very Energetic Radiation Imaging Telescope Array System (VERITAS) –in December 2012 and December 2020. We build multi-wavelength SEDs of the flares with VERITAS, Fermi-LAT, Swift-XRT, and Swift-UVOT data, and model the spectral energy distributions (SEDs) with a synchrotron self-Compton model using a tool called Bjet_MCMC. We discuss the SED modeling results and implications in this presentation.

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