Hands-on Exercise: Fitting a blazar spectral energy distribution

OJ 287 is a bright and interesting blazar at redshift $z = 0.306$.

Archival multiwavelength spectral data for this source have been shared on slack (OJ287 data.txt).

You can upload these datapoints to the sed builder tool https://www.isdc.unige.ch/sedtool/PROD/SED.html in order to study the radiation processes responsible for the emission of this source.

Set the redshift to 0.306 and in the "Model Model" menu, and select "Plot Type = observed" in the "Plot Menu" (and tick the "plot uploaded data" box).

Your task is to determine whether this source can be fitted with a simple Synchrotron Self Compton model, in other words, a model in which all emission is produced by a single population of electrons, or whether additional "external photon fields" are required. Reasonable starting parameters include blob radius $R \sim 10^{17}$ cm, and a broken exponential power law for the electron spectral distribution.

For some further insight on how to set reasonable parameters you can consult Section 8.9.2 of https://arxiv.org/abs/1202.5949 and for more details the surrounding chapters of these lecture notes.

For more in depth study the software https://agnpy.readthedocs.io/en/latest/ or https://github.com/andreatramacere/jetset can be used.