

The Blazar Hadronic Code Comparison Project: First Results

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Blazar hadronic models have been developed in the past decades as an alternative to leptonic ones. In hadronic models the gamma-ray emission is associated with synchrotron emission by protons in the jet, and/or secondary leptons produced in proton-photon interactions. Together with photons, hadronic emission models predict the emission of neutrinos from blazars. Neutrinos are therefore the smoking gun for acceleration of relativistic hadrons in blazar jets. The recent advances in neutrino astronomy, with IceCube detection of the first neutrino blazar TXS0506+056, have revived the interest in these hadronic scenarios. The simulation of proton-photon interactions and all associated radiative processes is a complex numerical task, and different approaches to the problem have been adopted in the literature. So far, no systematic comparison between the different codes has been performed, preventing a clear understanding of the underlying uncertainties in the numerical simulations. To fill this gap, we have undertaken the first comprehensive comparison of blazar hadronic codes, and the first results from this effort will be presented in this contribution.

Authors: Dr PETROPOULOU, Maria (Princeton University); CERRUTI, Matteo; KRETER, Michael (Bayerische Julius Max. Universitaet Wuerzburg (DE)); Dr GAO, Shan (DESY); RODRIGUES, Xavier (DESY Zeuthen); Dr MURASE, Kohta (Penn State University); RUDOLPH, Annika (Deutsches Elektronen-Synchrotron DESY); OIKONOMOU, Foteini (ESO); BOETTCHER, Markus (North-West University); REIMER, Anita (University of Innsbruck); IN-OUE, Susumu (RIKEN); MASTICHIADIS, Apostolos; STAVROS, Dimitrakoudis; ZECH, Andreas (Observatoire de Paris)

Presenter: RUDOLPH, Annika (Deutsches Elektronen-Synchrotron DESY)

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