

THE BLAZAR HADRONIC CODE COMPARISON PROJECT

M.Cerruti, M.Kreter, M.Petropoulou, A.Rudolph, F.Oikonomou, M.Böttcher, S.Dimitrakoudis, A.Dmytriiev, S.Gao, A.Mastichiadis, S.Inoue, K.Murase, A.Reimer, J.Robinson, X.Rodrigues, W.Winter, A.Zech, N.Żywucka

What is this contribution about? First extensive comparison of blazar hadronic codes in a large part of their parameter space

Why is it relevant? Recent evidences for neutrino emission from blazars have renewed interests in hadronic models. An extensive comparison of numerical codes is missing in the literature, preventing a quantitative estimate of the level of uncertainties related to numerical implementations.

What have we done? We compared outputs from 4 different hadronic codes, both in terms of observed neutrino spectra and SEDs, and injection spectra of secondary particles in the source frame. We included in the comparison an analytical approximation for neutrino production.

What is the result? We do not see any significant spectral difference among codes, besides distortions at cut-offs. We see a spread in normalization in all injected secondaries and in the neutrino spectra, at the level of about 30-40%. All curves will be released as online material together with the refereed publication, but feel free to contact us for early access.

cerruti@apc.in2p3.fr; michael@kreter.org; mpetropo@phys.uoa.gr; annika.rudolph@desy.de