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Investigating hadronic interaction model predictions for air showers in the 100 GeV-100 TeV range

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The predictions of high energy hadronic interaction models for hadron induced air showers contain significant systematic uncertainties due to the limits of both accelerator data and theoretical descriptions in the appropriate energy and rapidity ranges. Tuning for these models is typically performed to reproduce cosmic-ray data above 10^{15} eV, with energies below this often not being prioritised.

We will present detailed studies of hadronic air shower simulation predictions in the 100 GeV to 100 TeV energy range typically studied by very high energy gamma-ray telescopes. We describe the significant differences seen in important model predictions, most notably at the lower energy edge of the model validity (100 GeV). Finally we take a closer look at simulations of the discrete interactions within the air showers to try to correlate the differences in interaction physics between models with those seen in air shower behaviour.

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