Contribution ID: **337** Type: **Talk**

Data-driven model of the cosmic-ray flux and mass composition over all energies

Tuesday 28 August 2018 16:45 (17 minutes)

We present a new parametrisation of the cosmic-ray flux and its mass composition over an energy range from 1 GeV to 10^11 GeV. We combine measurements of the flux of individual elements from high-precision satellites and balloon experiments with indirect measurements of mass groups from the leading air shower experiments. We provide the first fit of this kind that consistently takes both statistical and systematic uncertainties into account. The uncertainty on the energy scales of individual experiments is handled explicitly in our mathematical approach. We obtain a common energy scale and adjustment factors for the energy scales of the participating experiments. Our fit has a reduced chi2 value of 1, showing that experimental data are in good agreement, if systematic uncertainties are taken into account. Our model may serve as a world-average of the measured fluxes for individual elements from proton to iron from 1 GeV to 10^11 GeV. It is useful as an input for simulations or theoretical computations based on cosmic rays. The experimental uncertainties of the input data are captured in a covariance matrix, which can be propagated into derived quantities.

Primary authors: Dr FEDYNITCH, Anatoli (DESY); Dr DEMBINSKI, Hans (MPIK Heidelberg); GAISSER, thomas (university of delaware)

Presenter: Dr DEMBINSKI, Hans (MPIK Heidelberg)

Session Classification: Cosmic Rays

Track Classification: Cosmic Rays