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Determination of source spectra of ultrahigh energy cosmic rays

Tuesday, August 4, 2015 4:00 PM (1 hour)

The energy spectra and composition of ultra-high energy cosmic rays are changing in a course of propagation in the expanding Universe filled with background radiation. We use a numerical code for solution of inverse problem for cosmic-ray transport equations that enables the determination of average source spectra of different nuclei from the cosmic ray spectra observed at the Earth. The source spectrum is calculated without ad hoc assumptions about its' shape. The injection spectra of a few groups of nuclei in extragalactic sources are found. The effects of cosmological source evolution and the finite distance to the nearest source are studied. The data from the
Auger experiment and the combined data from the Telescope Array + HiRes experiments are used to illustrate the method.

Collaboration

– not specified –

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