The numerical study of the origin of the ultra high energy cosmic rays with CRPropa.

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Abstract

The origin of ultra-high-energy cosmic rays is one of the most enigmatic questions in modern physics. The study of a such high-energy particles is a new and active research area where scientists wish to find the still-unknown sources and acceleration mechanisms of these particles. This work aims to interpret some recent experimental results provided by the Pierre Auger Observatory concerning the energy spectrum of cosmic rays above 10^{17} eV. We used the publically available Monte Carlo code CRPropa to simulate the propagation of ultra-high-energy cosmic rays in the universe, taking into account all relevant interactions, and also the influence of the galactic and extragalactic magnetic fields.