Contribution ID: **289**   Type: **Talk**

CRPropa 3.2: a framework for high-energy astroparticle propagation

Monday 12 July 2021 18:12 (12 minutes)

The landscape of high- and ultra-high-energy astrophysics has changed in the last decade, in large part owing to the inflow of data collected by cosmic-ray, gamma-ray, and neutrino observatories. At the dawn of the multimessenger era, the interpretation of these observations within a consistent framework is important to elucidate the open questions in this field. CRPropa 3.2 is a Monte Carlo code for simulating the propagation of high-energy particles in the Universe. This new version represents a step further towards a more complete simulation framework for multimessenger studies. Some of the new developments include: cosmic-ray acceleration, support for particle interactions within astrophysical sources, full Monte Carlo treatment of electromagnetic cascades, improved ensemble-averaged Galactic propagation, and a number of technical enhancements. Here we present some of these novel features and some applications to gamma- and cosmic-ray propagation.

Keywords

Collaboration

other Collaboration

Subcategory

Theoretical Methods

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Session Classification: Discussion

Track Classification: Scientific Field: MM | Multi-Messenger