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CRPropa 3.3: Toward a Unified Multi-Messenger Framework from GeV to ZeV Energies

With the recent advancements in multi-messenger astrophysics, there is a clear need for a simulation framework that can self-consistently treat all cosmic messengers. To meet this demand, the latest developments in CRPropa provide versatile new tools for modelling the propagation of cosmic rays, gamma rays, electrons, and neutrinos across galactic and extragalactic environments, as well as in the surroundings of astrophysical objects, from GeV to ZeV energies.

Since the last major release of CRPropa, several new features have been added. Key additions include new models of the extragalactic background light (EBL), spatially-dependent photon fields, new Galactic magnetic field models, and enhanced cosmic-ray tracking performance. This contribution highlights these improvements and showcases CRPropa's potential for multi-messenger studies.

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