

The FLUKA cross sections for galactic cosmic-ray propagation studies

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Current measurements of cosmic-ray fluxes have reached unprecedented accuracy thanks to the new generation of experiments, and in particular the AMS-02 mission. At the same time, significant progress has been made in the propagation models of galactic cosmic rays. These models include several propagation parameters, which are usually inferred from the ratios of secondary to primary cosmic rays, and which depend on the cross sections describing the collisions among the various species of cosmic-ray nuclei with the interstellar medium (spallation cross sections).

The current spallation cross sections are based on set of parametrizations mixing (few) data points and simulation predictions for those channels with no measurements. In this talk, we present new sets of spallation cross sections of cosmic-ray interactions in the Galaxy, both inelastic and inclusive, computed with FLUKA simulation code that has been extensively tested against data. Furthermore, these cross sections have been implemented in the DRAGON2 code to characterize the spectra of CR nuclei up to $Z=26$ (Iron) and study the main propagation parameters predicted from the spectra of secondary CRs such as B, Be and Li. These results and their implications will be discussed in the talk.

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