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Scrutinizing current uncertainties on cosmic-ray positron predictions

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Cosmic-ray (CR) antiparticles have the potential to reveal signatures of unexpected astrophysical processes and new physics. Recent CR detectors have provided accurate measurements of the positron flux, revealing the so-called positron excess at high energies. However, the uncertainties related to the modelling of the positron flux are still too high, significantly affecting our models of positron emission from pulsars and current dark matter searches.

In this talk, I'll show state-of-the-art predictions of CR positrons at Earth, focusing on the treatment of the secondary production of these particles. We show new cross sections derived from the FLUKA code and discuss the uncertainties related to cross sections, as well as to the other main sources of uncertainties affecting our predictions of CR positrons. Finally, we comment on the impact of these uncertainties in the evaluation of the positron emission from nearby pulsars and current WIMP searches with positrons.

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