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"Discrepant hardenings" in cosmic ray spectra: a first estimate of the effects on secondary antiproton and diffuse gamma-ray yields

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Recent data from CREAM seem to confirm early suggestions that primary cosmic ray spectra at few TeV/nucleon are harder than in the 10-100 GeV range. Also, helium and heavier nuclei spectra appear systematically harder than the proton fluxes at corresponding energies. We note here that if the measurements reflect intrinsic features in the interstellar fluxes, appreciable modifications are expected in the sub-TeV range for the secondary yields, such as antiprotons and diffuse gamma-rays. Presently, this effect represents a systematic error in the extraction of astrophysical parameters as well as for background estimates for indirect dark matter searches. We find that the spectral modifications are appreciable above 100 GeV, and can be responsible for ~30% effects for antiprotons at energies close to 1 TeV or for gamma's at energies close to 300 GeV, compared to currently considered predictions based on simple extrapolation of input fluxes from low energy data.

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