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The Sun at the TeV gammas, neutrons, neutrinos, and a cosmic ray shadow

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Abstract

High energy cosmic rays (CRs) reaching the surface of the Sun produce an energy dependent shadow that has been detected by several observatories. The missing CRs are processed there into secondary particles, including gammas, neutrons and neutrinos that may reach the Earth unaffected by the solar magnetic field. Here we study the correlation of the CR shadow
of the Sun with the flux of GeV–TeV neutral particles. We obtain a gamma flux that seems consistent with flux observed by Fermi-LAT and provide predictions for the neutron and neutrino fluxes.

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