

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

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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. These solar particles are a background in indirect searches for dark matter at gamma ray observatories and neutrino telescopes. Here we discuss 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 Fermi-LAT observations and provide predictions for the neutron and neutrino fluxes.

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