

Muon pairs at TeVs and PeVs energy decaying in flight, airshowering inside LHAASO lunar and solar shadows

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Skimming Cosmic Rays on the external Solar atmosphere can be showering in gamma, electron and muon pairs. Such secondaries of TeV or higher energy could reach Earth along a thin frontal solar ring. The gamma and electron rays are abundant, but originated in a thin layer of the solar atmosphere, disturbed and rare, spread in their propagation by solar corona fields and scattering. Secondary TeVs-PeVs-EeVs muons are much rare, but more penetrating and may escape from deeper solar edges, from a thicker ring area, better pointing towards our Earth. Their decay in flight into electron pairs, even partially deflected, must lead to rare gamma-like air-showers in LHAASO array detector sky, falling inside or around the Sun shadows.

These rare gamma z-like airshowers must be disentangled and observable in LHAASO in near future, within an energy range of few or ten TeV. A more rare, more exciting, signal must also from the entire lunar surface, by upward escaping TeVs muons, made by tens TeV astrophysical neutrino in a few kilometer lunar depth, shining towards the Earth.

The lunar mass volume calorimeter for such neutrinos is million times larger than the IceCube one, but the solid angle is extremely small. The expected solar and lunar air-shower rate and geometry in their shadows are described.

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