



Contribution ID: 168

Type: **Parallel Talk**

A new path for dark matter searches: cross-correlation between gamma rays and gravitational tracers

Wednesday, August 10, 2022 2:00 PM (20 minutes)

Dark matter in cosmic structures is expected to produce signals that originate from its particle-like nature, among which the electromagnetic emission represents a relevant opportunity. However, this emission is very faint and contributes only to the unresolved background radiation. This background emission is isotropic at first order, but exhibits a degree of anisotropy since it originates from clustered dark matter haloes. This fact implies that the anisotropies in the radiation field will be correlated to the matter distribution in the Universe.

One method to measure these anisotropies is the cross-correlation technique. In particular, we want to correlate gamma rays, indirectly produced by dark matter particles, with a gravitational tracer of the matter distribution. A positive signal in this cross-correlation channel would be the evidence that dark matter is made up of new elementary particles and is not a manifestation of an alternative theories of gravity.

I will describe this promising technique and some interesting applications to several gravitational tracers (neutral hydrogen, galaxies, cosmic shear). This technique can also be extended to include cosmic voids as a new probe for indirect detection of dark matter.

Collaboration name

Author: PINETTI, Elena (Fermilab)

Presenter: PINETTI, Elena (Fermilab)

Session Classification: Dark Matter

Track Classification: Dark Matter