



Contribution ID: 63

Type: **Parallel talk**

## **Search for annual modulation of the event rate generated by dark matter in the DarkSide-50 ionization signal**

*Tuesday, 29 August 2023 16:45 (15 minutes)*

DarkSide-50 is a direct detection experiment hunting for dark matter utilizing a dual-phase argon time projection chamber at LNGS in Italy.

On the basis of the ionization spectrum alone, it has established the most restrictive exclusion limit for low-mass dark matter candidates.

Due to its peculiar behavior, it is possible to search for dark matter in a model-independent manner by exploiting the expected variation of the relative velocity between dark matter and Earth.

We describe the first search for such an event rate modulation with argon using the DarkSide-50 ionization signal in this presentation, in particular a Lomb–Scargle analysis was used to look for a 1 year period peaking at June 2nd.

As a result of years of stable operation of the detector and a thorough knowledge of the detector's response, we were able to obtain the lowest energy threshold ever attained in this kind of experiments, on the order of sub-keV.

### **Submitted on behalf of a Collaboration?**

Yes

**Primary author:** Mr HUGUES, Theo (AstroCeNT (NCAC) / APC)

**Presenter:** Mr HUGUES, Theo (AstroCeNT (NCAC) / APC)

**Session Classification:** Dark matter and its detection

**Track Classification:** Dark matter and its detection