

# Search for secluded dark matter with 6 years of IceCube data

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## What is this contribution about?

- A search for secluded dark matter in the Sun using IceCube muon neutrino data captured between 2011 and 2016 with 1057.8 days of livetime
- Secluded dark matter is a model for dark matter where the DM particles do not directly decay or annihilate into Standard Model particles, but rather produce a pair of metastable mediator particles in annihilation that decay after some lifetime
- DM masses ranging from 250 GeV to 75 TeV and mediator decay lengths of 0.01 solar radii to 1 solar radii were considered. Mediator masses ranging from 10 GeV to 10 TeV and mediator decays into  $\tau$  and  $W$  have been studied.

## Why is it relevant / interesting?

- For long enough mediator decay lengths absorption of signal neutrinos in the Sun can be avoided
- In regular DM scenarios absorption in the sun causes significant attenuation and effectively cuts off the signal neutrino spectrum at 1 TeV neutrino energy
- As IceCube is most sensitive to high energy neutrinos the enhanced signal from SDM is particularly interesting for an analysis with this detector

## What has been done?

- The analysis has been performed and no significant excess over the expected background has been discovered
- Exclusion limits have been set for all considered points in the explored parameter space

## What is the result?

- The results presented here show exclusion limits comparable to those of other neutrino experiment for SDM.
- Using more data and more accurate signal simulations leading results may be obtained

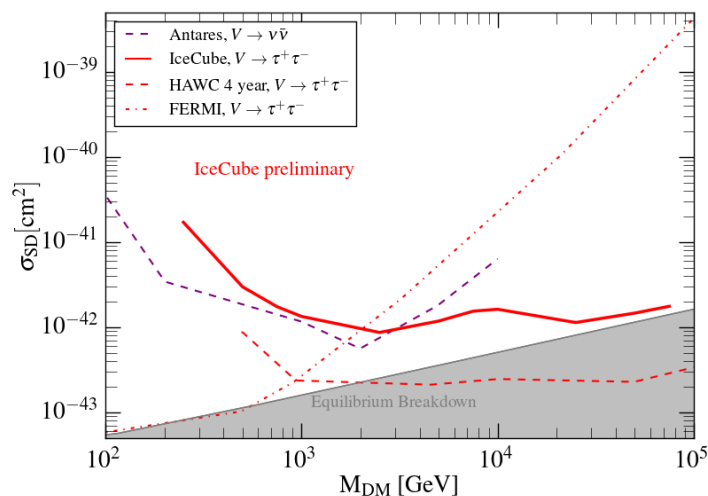


Figure 1: The limits on the spin dependent dark matter-nucleon scattering in comparison to other experiments.