

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

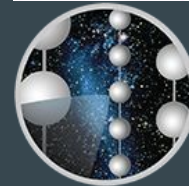


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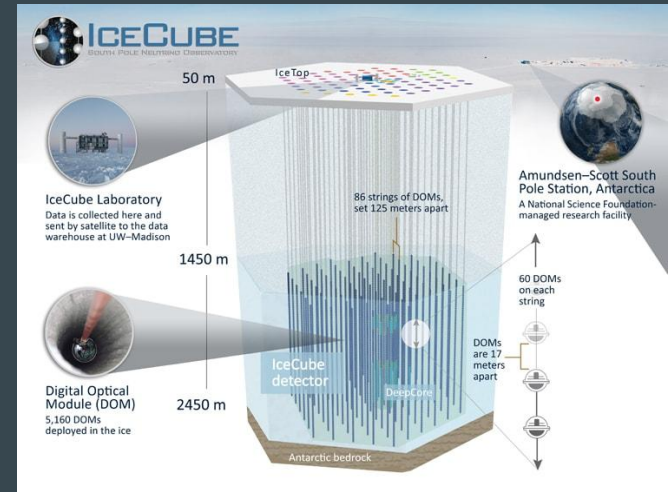
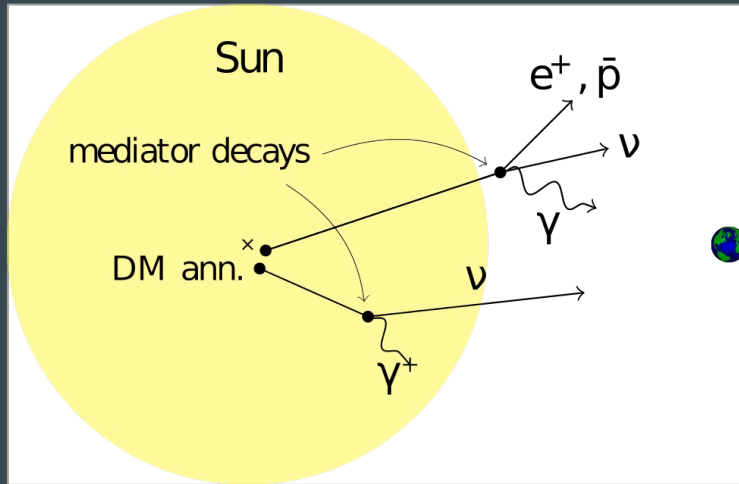
ICRC2021

Christoph Tönnis



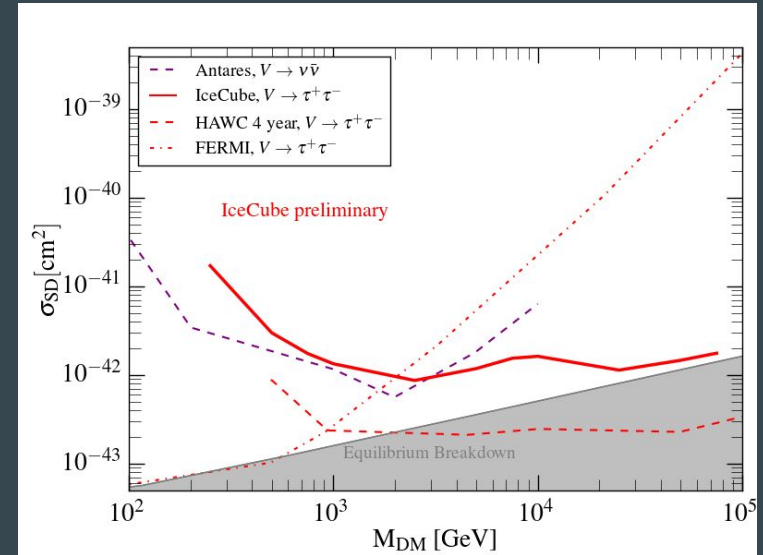
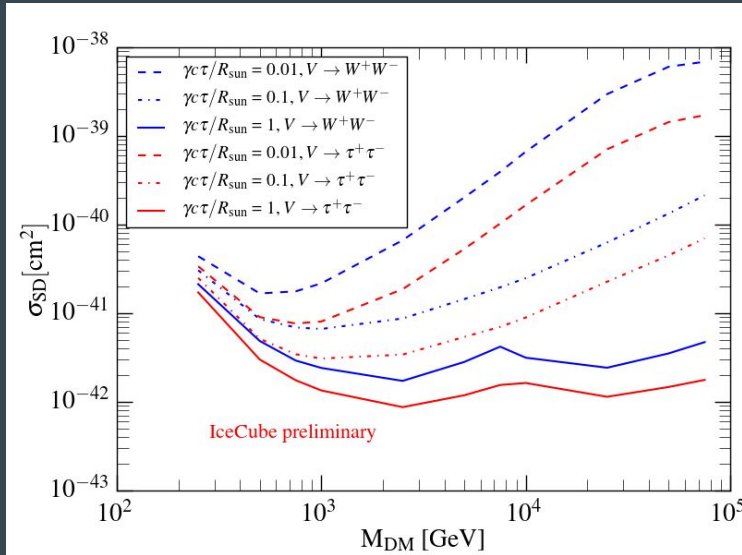
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# Secluded Dark Matter



- Secluded dark matter is a particle model for dark matter where the dark matter particle annihilates into a metastable mediator particle, that decays into pair of standard model particles.
- For DM in the Sun the mediator can be long-lived enough to escape the solar plasma before decay
- This yields an enhanced high energy neutrino signal.
- In other models signal is cut due to absorption at 1 TeV
- DM masses of 250 GeV to 75 TeV, mediator decay lengths from 0.01 to 10 solar radii and mediators decaying into W bosons and taus have been considered.
- Since the simulation code WIMPSIM that was used for this analysis does not include electroweak correction other decay channels were excluded
- An IceCube muon neutrino dataset recorded between 2011 and 2016 with 10578 days of livetime was used to search for Secluded dark matter signals in the Sun

# Results



- No significant excess above the expected background was found in the examined dataset
- The limits for the tau channels are at a similar level as the results from ANTARES for the neutrino channel and surpass them at higher masses.
- The limits are within an order of magnitude of those produced by the HAWC and FERMI collaborations.
- If direct decays into neutrinos were considered the results would surpass those of ANTARES.
- In a future analysis more data and a different signal simulation accounting for electroweak corrections will be used.