

# Testing Heavy Neutral Leptons in "Cosmic Ray Beam Dumps"

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based on  
(arXiv: [2301.07120](https://arxiv.org/abs/2301.07120)) by O. Fischer, BP, J. Zurita

Light Dark World 2025



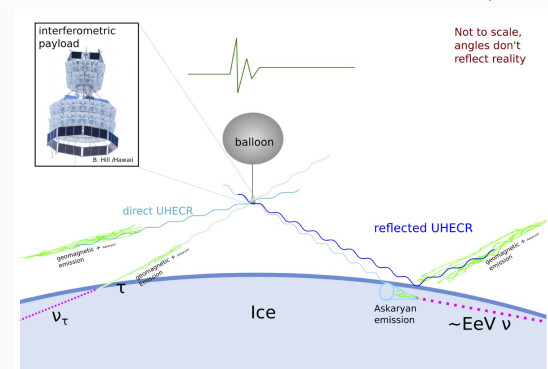
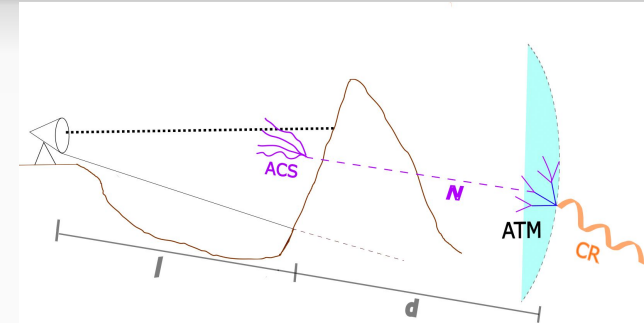
# SHALON and ANITA anomalies

## SHALON:

- Atmospheric Cherenkov telescope
- Operational energy range: 0.8-100 TeV
- 5 anomalous showers around 10 TeV, no SM explanation

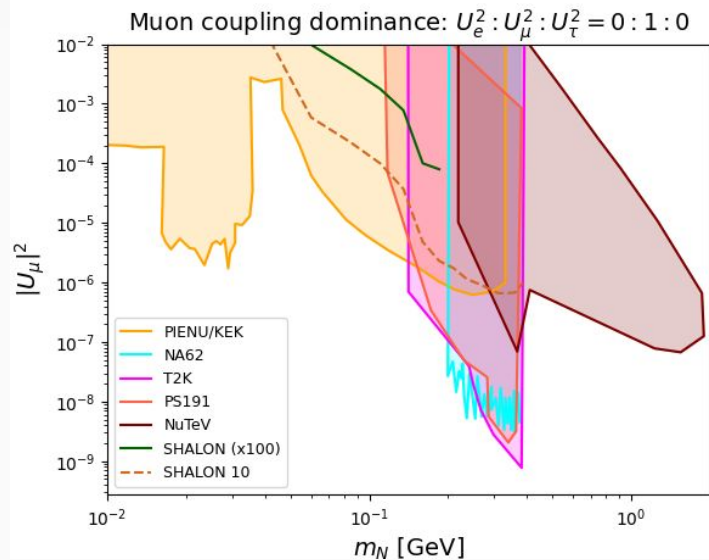
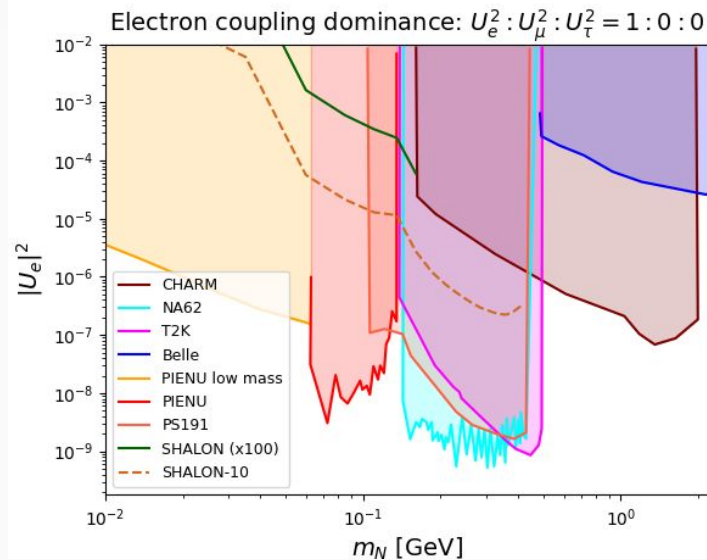
## ANITA:

- Balloon-borne experiment
- Two anomalous Earth-emergent UHE showers detected



**CAN THESE ANOMALIES BE EXPLAINED BY HNLs?**

# Betteridge's law strikes!



- SHALON is ruled out by existing experiments, ANITA count rates too low
- Reducing SHALON threshold to 10 GeV does not work either

**Can we tweak SHALON and ANITA to detect HNLs?**