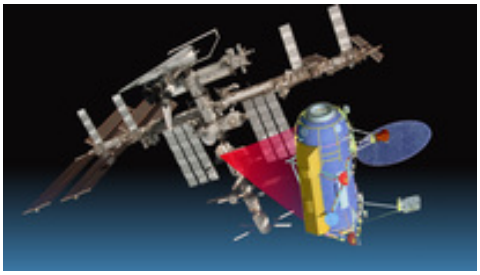

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Hunting for ANITons with EUSO-SPB2

The ANITA Collaboration has reported the detection of two upward-propagating extensive air showers emerging from well below the horizon with energies ~ 500 PeV. While in principle this type of event has been anticipated as a result of astrophysical τ-neutrinos converting to τ-leptons during Earth passage, the origin of ANITA events remains intriguing because the observed exit angles create a tension with the standard model (SM) neutrino-nucleon interaction cross section. Actually, under conservative extrapolations of SM physics, there is no particle that can propagate through the Earth with a probability $p > 10^{-6}$ at these energies and exit angles. Leaving aside systematic effects that may be at play, any other possible explanation of these exotic events (nicknamed ANITons) would require some kind of new physics beyond the SM. In this talk we will investigate the feasibility to search for ANITons using the the second generation Extreme Universe Space Observatory on a Super-Pressure Balloon (EUSO-SPB2) mission, which has been approved by NASA for a long duration flight in 2022.

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