

Radio Simulations of Upgoing Extensive Air Showers Observed from Low-Earth Orbit

Executive Summary

Tau neutrinos interacting in the Earth can result in upgoing extensive air showers. These showers produce optical and radio emission that can be detected by orbital and suborbital platforms. We present results of radio emission simulations using ZHAireS for observation from low-Earth orbit as part of NASA's nuSpaceSim program to develop a comprehensive end-to-end simulation package to model these signals. Peculiar properties of the radio emission arise from the fact that these showers develop in extremely rarified portions of the Earth's atmosphere and, being observed from hundreds of kilometers distance, have distinct coherent emission features compared to ground observations.