

Contribution ID: 534

Type: Poster

No Flavor Anisotropy in High-Energy Astrophysical Neutrinos Upholds Lorentz Invariance

Do neutrinos of different flavors have preferred directions of travel? If they do, it would imply a violation of Lorentz invariance, a cornerstone of modern physics. This would manifest as "flavor anisotropies" differences in the arrival-direction distributions of astrophysical neutrinos of different flavors at Earth. In beyond-Standard-Model theories, these effects grow with neutrino energy, making TeV–PeV astrophysical neutrinos ideal probes. We search for flavor anisotropies in public IceCube data and, finding none, place constraints on hundreds of free coefficients governing Lorentz-invariance violation—many of which were previously unconstrained or only weakly constrained. As far as current observations of high-energy astrophysical neutrinos reveal, the Universe upholds Lorentz invariance.

Collaboration(s)

Authors: Dr BUSTAMANTE, Mauricio (Niels Bohr Institute); TELALOVIC, Bernanda (Niels Bohr Institute)

Presenter: Dr BUSTAMANTE, Mauricio (Niels Bohr Institute)

Session Classification: PO-2

Track Classification: Neutrino Astronomy & Physics