



Contribution ID: 225

Type: **not specified**

## Could quantum gravity slow down neutrinos?

*Wednesday, September 13, 2023 5:40 PM (15 minutes)*

In addition to its implications for astrophysics, the hunt for neutrinos from Gamma-Ray Bursts (GRBs) could also be significant in quantum-gravity research, since they are excellent probes of the microscopic fabric of spacetime. Over the last few years one of the most studied candidate effects of quantum gravity has been in-vacuo dispersion, a phenomenon suggesting an energy-dependent speed variation for ultrarelativistic particles, also associated with Lorentz Invariance Violation (LIV). In this study, we investigated the hypothesis that some neutrinos detected by the IceCube observatory might be GRB neutrinos, with their travel times affected by energy-dependent speed. Our findings provide intriguing indications that these neutrinos might indeed experience a delay relative to the detection time of the GRB, proportional to the neutrino's energy.

**Primary authors:** D'AMICO, Giacomo (University of Bergen); ROSATI, Giacomo (CA); AMELINO-CAMELIA, Giovanni (University of Napoli Federico II); GUBITOSI, Giulia (Università di Napoli Federico II and Istituto Nazionale di Fisica Nucleare); DI LUCA, Maria Grazia (SSM)

**Presenter:** GUBITOSI, Giulia (Università di Napoli Federico II and Istituto Nazionale di Fisica Nucleare)

**Session Classification:** GWMM: Gravitational Waves & MultiMessenger

**Track Classification:** Gravitational Waves & MultiMessenger