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The HERMES Project: Probing Space-time Quantum Foam and Hunting for Gravitational Wave Electromagnetic Counterpart"

Thursday 12 September 2019 17:35 (15 minutes)

I discuss how several of the proposed models for space-time quantization predict an energy dependent speed for photons.
Although the predicted discrepancies with the general speed of light are minuscule, I discuss how it is possible to detect this intriguing signature of space-time granularity with a new concept of modular observatory for photons in the energy band from few keV to few MeV. This observatory may consist of a swarm of micro/nano-satellites on low orbits. Sub-microsecond time resolution and wide energy band allows to probe tiny energy dependent delays, expected to be the signature of the granular structure of space-time in several of the proposed theories of Quantum Gravity. Moreover this kind of experiment allows to perform temporal triangulation of high signal to noise impulsive events with positional accuracies of few arcseconds, making an observatory like that a promising hunter for the elusive electromagnetic counterparts of Gravitational Waves.

Topic

Future missions

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