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Measuring space-time fuzziness with high energy gamma-ray detectors

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There are several suggestions to probe space-time fuzziness (also space-time foam) due to the quantum mechanics nature of space-time. These effects are predicted
to be very small, being related to the Planck length, so that the only hope to experimentally detect them is to look at propagation of particles along cosmological
distances. A fenomenological approach suggests that photons from point-like sources at cosmological distance experience path length fluctuations that could be detected.
Also the direction of flight of such photons will be subject to a dispersion such that the image of a point-like source will be blurred and detected as a disk.
This foam-induced blurring is expected to increase with the photon energy and with the distance.
A signature of foam-induced blurring will be images of point-like sources larger that the size due to the PSF of the instrument. The gamma-ray experiments AGILE and FERMI with their optimal angular resolutions offer ideal conditions for such searches. A preliminary study of the potentiality of this approach is presented.

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