ID de Contribution: **240** Type: **Parallel session talk**

The GRANIT project: status and perspectives

vendredi 22 juillet 2011 12:30 (15 minutes)

The GRANIT project is the follow-up of the pionnering experiments that first observed the quantum states of neutrons trapped in the earth's gravitational field at the Institute Laue Langevin (ILL) [1]. Due to the weakness of the gravitational force, these quantum states exhibit most unusual properties: peV energies and spatial extensions of order 10 m. Whereas the first series of observations aimed at measuring the properties of the wave functions, the GRANIT experiment will induce resonant transitions between various states and measure their energy differences, thus improving dramatically the sensitivity.
In this talk, I will present the status of the experiment presently under commissioning at the ILL. I will then discuss the potential of GRANIT to searches for new physics and in particular to a modified Newton law in the micrometer range.

[1]. V.V. Nesvizhevsky et al, Nature 415 (2002); Phys. Rev. D 67 (2003) 102002.

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Classification de Session: Cosmology and Gravity