

LABORATORI NAZIONALI DEL GRAN SASSO

SEMINAR ANNOUNCEMENT

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**"Magnetic anomaly in trapping of
Ultra Cold Neutrons:
signal for neutron oscillations to
parallel world?"**

Re-analyzing recent experimental data on ultra-cold neutron losses in magnetic field of about 0.2 G, acquired by the group of A. Serebrov at PF2 reactor facility at the Institute of Laue-Langevin (Grenoble), we found an anomalous dependence on the magnetic field direction at more than 5 sigma level. This anomaly can be explained by the neutron oscillations $n-n'$ to its mass degenerate sterile twin from a hypothetical parallel sector, so called mirror neutron, with a timescale of few seconds, provided that the Earth possesses a mirror magnetic field order 0.1 G. Such a fast baryon number violation process, in fact faster than neutron decay itself, can have striking astrophysical and cosmological implications for primordial baryogenesis and dark matter, BBN, neutron stars and ultra-high energy cosmic rays. We also discuss new experiments necessary for testing $n-n'$ oscillations.

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