## 2015 CAP Congress / Congrès de l'ACP 2015



Contribution ID: 726

Type: Oral (Non-Student) / orale (non-étudiant)

## High-voltage breakdown studies with Xe-129 for an nEDM experiment at TRIUMF

Thursday 18 June 2015 09:45 (15 minutes)

Measuring the neutron Electric Dipole Moment (nEDM) would help answer fundamental cosmological questions like why matter dominated over antimatter even though they are thought to be produced at equal amounts after the Big Bang.

One of the main sources of the systematic uncertainties in the recent nEDM experiments was related to magnetic field fluctuations. For the KEK-RCNP/TRIUMF experiment we aim to use a Xe-129 optical comagnetometer which is expected to record magnetic temporal variations contributing to statistical and systematic errors less than what the Hg-199 co-magnetometer has in the past. This is mainly due to the smaller neutron absorption cross section and the negative (as that of the neutron) gyromagnetic ratio that Xe-129 possesses. The dielectric properties of Xe-129 in the mTorr region where the optical signal will be strong enough have to be explored as the Ramsey resonance technique of the experiment requires a stable electric field of about 12.5 kV/cm in order to improve the current nEDM upper limit.

The objective of the experimental work carried out at TRIUMF is primarily to find the relation between the breakdown voltage and the Xe-129 pressure for given electrode geometry and material. In addition to that, the possibility of using Xe-129 in a mixture with other gases (as Hg-199 and He-4) is being explored.

Author: Dr KATSIKA, Katerina (TRIUMF)

Presenter: Dr KATSIKA, Katerina (TRIUMF)

**Session Classification:** R1-6 Testing Fundamental Symmetries II (DTP-PPD-DNP) / Tests de symétries fondamentales II (DPT-PPD-DPN)

Track Classification: Particle Physics / Physique des particules (PPD)