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The ultra-cold neutron facility at TRIUMF (I)

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Neutrons converted to low energies of several hundreds of neV are referred to as ultra-cold neutrons (UCN). Their unique storage properties and resulting long observation times make them an ideal tool to study fundamental properties. Results obtained from measurements of the neutron lifetime and experiments searching for a neutron electric dipole moment (EDM) have profound consequences for the evolution of the Universe after the Big Bang as well as our understanding of the Standard Model in general. Experimental sensitivity of these measurements will greatly benefit from higher statistics, eg. improved UCN production.

The Canadian-Japanese TUCAN collaboration anticipates to build a strong UCN source based on a unique combination of a spallation target and a superfluid helium converter to establish a leading UCN user facility at TRIUMF. A major milestone has been reached in fall 2017 with the first successful production of UCN in Canada.

The presentation shall give an overview and status update of the TRIUMF UCN facility, report on first results from UCN production and introduce plans for a neutron EDM measurement with an anticipated sensitivity level of at least $1e-27$ ecm.

Author: KUCHLER, Florian

Presenter: KUCHLER, Florian

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