

Progress towards a next generation UCN source at TRIUMF

Tuesday 10 September 2013 18:00 (3 hours)

Most (if not even all) experiments with ultra-cold neutrons (UCN) currently under development need higher UCN densities than presently available. There are multiple efforts world wide to achieve an increase of up to three orders of magnitude in the storable number of UCNs. Different combinations of neutron source and UCN converter are used by the various groups.

Neutrons either come from a research reactor or an accelerator-driven spallation source; superfluid helium or frozen deuterium are used as converter material.

The UCN source at TRIUMF in Canada will use the 480-MeV proton beam from the cyclotron impinging on a tungsten target to create spallation neutrons. A combination of lead, graphite, light and heavy water and possibly liquid deuterium and Be will moderate the neutrons; the superthermal converter He-II scatters the neutrons down to the ultra-cold regime.

With a beam current of 40 μA , a density of $> 1\text{e4/cc}$ should be achievable.

The progress towards the dedicated UCN beamline at TRIUMF, the optimization of the moderator design and development of the neutron electric dipole moment experiment will be presented.

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