

First Circular

Dear colleagues,

it is our pleasure to invite you to a dedicated workshop on the muon EDM:

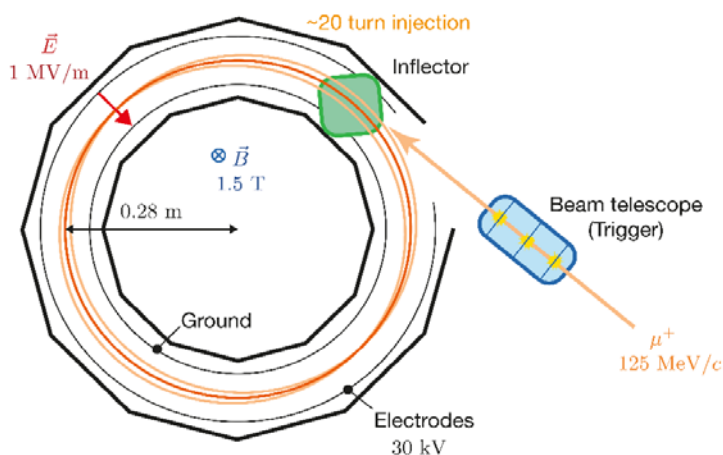
Kick-off workshop for the search of a muon EDM using the frozen spin technique at PSI

to be held at the Paul Scherrer Institute, Switzerland, on

17.-19.02.2020.

The aim of the workshop is to bring together scientists strongly motivated to participate in a search for a muon electric dipole moment (EDM) using the frozen spin technique at PSI. Assuming CPT invariance, electric dipole moments violate the combined symmetry of charge and parity (CP) and are thus of particular interest as probes for CP violation beyond the standard model. Presuming lepton flavor universality (LFU) the stringent limit on the electron EDM ($d_e < 1.1E-29$ ecm) [1], measured using molecules, translates by mass scaling also to $d_\mu < 2.2E-27$ ecm, a value about 8 orders of magnitude smaller than the current direct upper limit of $d_\mu < 1.8E-19$ ecm [2]. However, theories that abandon LFU [3] and references therein generally predict much larger values and are of increasing interest in the light of recent deviations from the SM in B-factories measurement of semileptonic meson decays and the muon $g-2$ discrepancy.

Employing the frozen spin technique [4] in a dedicated compact storage ring [5] at PSI would allow an improvement of the current direct limit by 3 orders of magnitude.



Topics of the workshop are:

- beam properties and beam injection into a compact storage ring
- electric and magnetic field properties and generation
- storage ring and kicker magnet
- simulations and finite element calculations (electric field / magnetic field)
- muon trigger and positron tracking
- data acquisition and fast electronics

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1. ACME collaboration, Nature 562(2018)355
2. Bennett et al, PRD80(2009)052008
3. e.g. Crivellin et al., PRD98(2018)113002
4. Farley et al., PRL93(2004)052001
5. Adelmann et al., JPG37(2010)085001



The workshop will be organized as a topical seminar with break-out sessions addressing the different challenges of a compact muon storage ring employing the frozen spin technique to search for an electric dipole moment of the muon. In addition to invited contributions (30'), we very much appreciate shorter contributions by all participants. We plan for ample discussion time in each session.

The break-out sessions will be organized in parallel and will each work on one particular aspect of the experiment. The results of these breakout sessions will then be presented and discussed in a common session. Each group working on a particular topic shall provide a write-up, which then will be used as input for a letter-of-interest to the physics advisory committee at PSI.

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Organizational committee:

Anita Van Loon (Workshop secretary)

Mikio Sakurai

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with advise and support from:

Andreas Adelmann, PSI, Switzerland

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