

## Contribution submission to the conference Würzburg 2018

**Status of a Design Study for a Proton EDM Ring** — ●MARTIN  
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Electric Dipole Moments (EDMs) of charged particles are an important place to search for physics beyond the Standard Model. In order to measure EDMs directly, strong electric fields (in the particle's rest frame) are required. To capture charged particles, a storage ring is necessary. The observable of an EDM is a particular rotation of the spin due to the torque exerted by the electric field. Because the spin precession due to the EDM is expected to be many orders of magnitude smaller than that due to the magnetic dipole moment (MDM), false spin rotations due to the MDM that could create a fake EDM signal have to be suppressed or understood very accurately. Here we report about the current status and challenges of a design study for a dedicated, all-electric storage ring to measure the proton EDM. In such a ring, two counterrotating, longitudinally (spin-) polarized proton beams with kinetic energy of 232 MeV would be stored for about 1000 seconds. There are several challenges for the design of such a ring. First of all, there are many conflicting requirements and second, detailed spin dynamics calculations have to be incorporated into the design process from the start. Furthermore, tight tolerances on field quality, element placement and magnetic shielding etc. exist.

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