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Electric field devices for the EDM prototype ring

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In the framework of the Physics Beyond Colliders (PBC) study at CERN, the Electric Dipole Moment (EDM) working group is investigating the feasibility of building a storage ring to precisely measure the permanent electric dipole moment of the proton. As a preparation for this main ring, a prototype ring (PTR) is proposed to demonstrate the feasibility of technologies that are not yet operationally confirmed. The PTR is to be small and simple to contain the cost, and will therefore have a circumference of < 100 m. The power supply voltages of the PTR will be limited to 200 kV. The mainly electric field ring will store protons at an energy of 30 MeV for stage 1 and 45 MeV for stage 2 (where frozen spin optics will be pursued). This article describes the challenges related to the electric field quadrupoles of the PTR as well as to the injection elements. The feasibility of the each element will be discussed and the outstanding issues will be highlighted.

Primary author: BORBURGH, Jan (CERN)

Presenter: BORBURGH, Jan (CERN)

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