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Beam options for the REDTOP experiment

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The proposed REDTOP experiment is a η/η' factory aiming to explore dark matter and physics beyond the Standard Model. The η and η' mesons are almost unique in the particle universe because of their quantum numbers and the dynamics of their decay are strongly constrained. This effect increases the branching ratio of rare decays which can be studied to probe physics BSM. The integrated eta meson samples collected in earlier experiments have been about ~10^9 events, dominated by the WASA at Cosy experiment, limiting considerably the search for such rare decays. A new experiment, REDTOP, is being proposed, aiming at collecting more than 10^{14} eta/yr (10^{12} eta'/yr) for studying of rare η decays.

Such statistics are sufficient for investigating several symmetry violations, and for searches of new particles beyond the Standard Model.

Recent physics and detector studies indicate that REDTOP has excellent sensitivity to probe all four portals connecting the dark sector with the Standard Model. Furthermore, conservation laws and violation of discrete symmetries can be probed in several ways.

Several production mechanisms are available for a super η/η'-factory. They require different beam species and properties, available at different HEP or nuclear laboratories around the World.

The beam options, the corresponding physics program, and the detector for REDTOP will be discussed during the presentation.

Funding Agency

Footnotes

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Yes

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