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The REDTOP experiment: a low energy meson factory to explore dark matter and physics beyond the Standard model

The η and η' mesons are almost unique in the particle universe since they are Goldstone boson and the dynamics of their decay are strongly constrained. The integrated eta meson samples collected in earlier experiments have been about $\sim 10^9$ events, dominated by the WASA at Cosy experiment, limiting considerably the search for such rare decays. A new experiment, REDTOP, is being proposed, with the intent of collecting more than 10^{13} eta/yr (10^{11} 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.

With tagged-eta experiment the fully constrained kinematic of the process allows for searches of light dark matter with a "Missing 4-momentum technique" which, at present, cannot be exploited by any other existing or proposed experiment.

The physics program and the detector for REDTOP will be discussed during the presentation.

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