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Search for a Dark Leptophilic Scalar ϕ_L in $e^+e^- \to tau + tau - \phi_L$ with the BABAR detector

Content

Many models of dark matter and hidden sectors predict new particles with masses below the electroweak scale. Low-energy electron-positron colliders such as BABAR are ideally suited to discover these hidden-sector particles. We present a recent search for prompt and long-lived hidden scalars produced in association with tau leptons and decaying into a lepton pair. This search is sensitive to viable models that could account for the muon $g-2$ excess. We also present results a search for dark muonic forces, and for invisible particles produced in six-quark final states. These examples show the importance of B-factories in constraining and discovering new hidden-sector physics beyond the Standard Model.

Summary

Primary author(s) : Dr. ANULLI, Fabio (INFN Roma); Dr. ROBERTSON, Steven (McGill University)

Presenter(s) : Dr. ROBERTSON, Steven (McGill University)