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Search for Baryogenesis and Dark Matter in *B*-meson decays at *BABAR*.

Tuesday, 5 December 2023 17:00 (20 minutes)

We present the most recent *BABAR* searches for reactions that could simultaneously explain the presence of dark matter and the matter-antimatter asymmetry in the Universe. This scenario predicts exotic *B*-meson decays into an ordinary-matter baryon and a dark-sector anti-baryon ψ_D with branching fractions accessible at the *B* factories.

The results are based on the full data set of about 430 fb^{-1} collected at the $\Upsilon(4S)$ resonance by the *BABAR* detector at the PEP-II collider.

We search, in particular, for decays like $B^0 \rightarrow \psi_D \text{ cal}B$ where *calB* is a baryon (proton or Λ). The hadronic recoil method has been applied with one of the *B* mesons from $\Upsilon(4S)$ decay fully reconstructed, while only one baryon is present in the signal *B*-meson side. The missing mass of signal *B* meson is considered as the mass of the dark particle ψ_D . Stringent upper limits on the decay branching fraction are derived for ψ_D masses between 1.0 and $4.3 \text{ GeV}/c^2$.

Name of collaboration or list of co-authors

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