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Recent Dark Matter related searches with the BABAR detector

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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 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 $\text{cal}B$ is a baryon (proton, Λ , or Λ_c). 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 $4.2 \text{ GeV}/c^2$.

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