

## Search for invisible decay of a dark photon produced in $e^+e^-$ collisions at BABAR

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We report on a search for single-photon events in  $53 \text{ fb}^{-1}$  of  $e^+e^-$  collision data collected with the BABAR detector at the PEP-II B-factory. We look for events with a single high-energy photon and a large missing momentum and energy, consistent with production of a spin-1 particle  $A'$  through the process  $e^+e^- \rightarrow \gamma A'$ ,  $A' \rightarrow \text{invisible}$ . Such particles, referred to as “dark photons”, are motivated by theories applying a  $U(1)$  gauge symmetry to dark matter. We find no evidence for such processes and set 90% confidence level upper limits on the coupling strength of  $A'$  to  $e^+e^-$  for a dark photon with a mass lower than 8 GeV. In particular, our limits exclude the values of the  $A'$  coupling suggested by the dark-photon interpretation of the muon  $(g-2)$  anomaly, as well as a broad range of parameters.

**Primary author:** Dr WILSON, Fergus (STFC Rutherford Appleton Laboratory)

**Presenter:** Dr WILSON, Fergus (STFC Rutherford Appleton Laboratory)

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