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| Title: | First observation of $\gamma\gamma \rightarrow p^-pK + K^-$ and search for exotic baryons in pK systems |
| Authors: | Bhardwaj, V. (/jspui/browse?type=author&value=Bhardwaj%2C+V.) |
| Keywords: | Asymmetric-energy KEKB Intermediate processes Belle detector |
| Issue Date: | 2016 |
| Publisher: | American Physical Society |
| Citation: | Physical Review D, 93(11). |
| Abstract: | The process $\gamma\gamma \rightarrow p^-pK + K^-$ and its intermediate processes are measured for the first time using a 980 fb^{-1} data sample collected with the Belle detector at the KEKB asymmetric-energy e^+e^- collider. The production of $p^-pK + K^-$ and a $\Lambda(1520)0(\overline{\Lambda}(1520)0)$ signal in the $pK-(\overline{p}K+)$ invariant mass spectrum are clearly observed. However, no evidence for an exotic baryon near $1540 \text{ MeV}/c^2$, denoted as $\Theta(1540)0(\overline{\Theta}(1540)0)$ or $\Theta(1540)++(\overline{\Theta}(1540)--)$, is seen in the $pK-(\overline{p}K+)$ or $pK+(\overline{p}K-)$ invariant mass spectra. Cross sections for $\gamma\gamma \rightarrow p^-pK + K^-$, $\Lambda(1520)0\overline{p}K++c.c.$ and the products $\sigma(\gamma\gamma \rightarrow \Theta(1540)0\overline{p}K++c.c.)$, $B(\Theta(1540)0 \rightarrow pK-)$ and $\sigma(\gamma\gamma \rightarrow \Theta(1540)++\overline{p}K-+c.c.)$, $B(\Theta(1540)++ \rightarrow pK+)$ are measured. We also determine upper limits on the products of the χ_{c0} and χ_{c2} two-photon decay widths and their branching fractions to $p^-pK + K^-$ at the 90% credibility level. |
| Description: | Only IISERM authors are available in the record. |
| URI: | https://journals.aps.org/prd/abstract/10.1103/PhysRevD.93.112017 (https://journals.aps.org/prd/abstract/10.1103/PhysRevD.93.112017) http://hdl.handle.net/123456789/2557 (http://hdl.handle.net/123456789/2557) |
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