

Observation of the doubly strange b baryon Ω_b^-

Tuesday 18 August 2009 14:00 (1 minute)

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We report the observation of the doubly strange b baryon Ω_b^- in the decay channel $\Omega_b^- \rightarrow J/\psi \Omega^-$, with $J/\psi \rightarrow \mu^+ \mu^-$ and $\Omega^- \rightarrow \Lambda K^- \rightarrow (p \pi^-) K^-$, in $p\bar{p}$ collisions at $\sqrt{s} = 1.96$ TeV.

Using approximately 1.3 fb^{-1} of data collected with the D0 detector at the Fermilab Tevatron Collider, we observe $17.8 \pm 4.9 \text{ (stat)} \pm 0.8 \text{ (syst)}$ Ω_b^- signal events at a mass of $6.165 \pm 0.010 \text{ (stat)} \pm 0.013 \text{ (syst)}$ GeV. The significance of the observed signal is 5.4σ , corresponding to a probability of 6.7×10^{-8} of it arising from a background fluctuation.

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Session Classification: Poster Session

Track Classification: Poster Session