

The Decay $\Sigma^+ \rightarrow p\mu^+\mu^-$ and Possible New Physics from HyperCP

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The Fermilab HyperCP (E871) experiment collected $\sim 10^{10}$ hyperon decays in the 1997 and 1999 runs. Using the data from the 1999 run, we will report on the observation of 3 clean events with reconstructed masses consistent with the hypothesis $\Sigma^+ \rightarrow p\mu^+\mu^-$. This is the rarest decay ever observed in the baryon sector. The dimuon mass distribution is unexpectedly narrow. Possible interpretations of the observed events will be discussed including the decay of an sgoldstino-like particle.