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New Results on Υ Production Using p+p and p+d Interactions

PAUL REIMER, Argonne National Laboratory, LINGYAN ZHU, Hampton University, JEN-CHIEH PENG, University of Illinois, FERMILAB E866/NUSEA COLLABORATION — The NuSea/E866 experiment at Fermilab has completed a high statistics measurement of Υ production using an 800 GeV/c proton beam on liquid hydrogen and deuterium targets. The dominance of the gluon-gluon fusion process for Υ production at this energy implies that the cross section ratio, $\sigma(p + d \rightarrow \Upsilon)$, is sensitive to the gluon content in the neutron relative to that in the proton. Over the kinematic region $0 < x_F < 0.6$, this ratio is found to be consistent with unity, in striking contrast to the behavior of the Drell-Yan cross section ratio $\sigma(p + d)_{DY}/2\sigma(p + p)_{DY}$. This is consistent with no charge symmetry breaking effect in the gluon distributions, showing that the gluon distributions in the proton and neutron are very similar. The Υ production cross sections are also compared with the $(p + d)$ and $(p + Cu)$ cross sections from earlier measurements.

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