Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Observation of Scaling in the Ratio of Electroproduction Yields of Three Meson-Baryon Final States: $K^+\Lambda$, $n\pi^+$, $p\pi^0$ MAC MESTAYER, KIJUN PARK, Jefferson Lab, CLAS COLLABORATION — We measured the ratios of electroproduction cross-sections for three exclusive meson-baryon final states: $K^+\Lambda$, $p\pi^0$, and $n\pi^+$. After averaging over the angle between leptonic and hadronic production planes we observe only a moderate kinematic dependence ("scaling") of the ratios with respect to Q^2, W and $\cos\theta^*$. Our results agree well with a simple calculation based on the "Lund model" for hadronization in which the color flux-tube is broken by the creation of $q\overline{q}$ pairs and which works well up to center-of-mass energies equal to the Z^0 mass. Interestingly, our measured global average $K^+\Lambda/n\pi^+$ production ratio of $0.278 \pm 0.013 \pm 0.042$ agrees with the nominal value of the "strangeness suppression factor" of the Lund model of 0.3; extending the universality of this concept to the exclusive limit in which only a single $q\overline{q}$ pair is created and for which an explict two-body phase-space correction can be performed. In addition, our measurement of the $p\pi^0/n\pi^+$ ratio of $0.467 \pm 0.008 \pm 0.086$ is consistent with equality of the $u\overline{u}$ and $d\overline{d}$ pair creation probabilities.

Mac Mestayer
Jefferson Lab

Date submitted: 27 Jun 2013 Electronic form version 1.4