Abstract Submitted
for the DNP12 Meeting of
The American Physical Society

**Pion Cloud Contributions to the Proton Sea**[1] KAYLA FURUKAWA, FERAS ALDAHLAWI, Seattle University, KARA MERFELD, University of Puget Sound — A proton may split into a meson and a baryon as allowed by the Heisenberg uncertainty principle. This process and the possible meson-baryon combinations have been studied by several theoretical models. In this study, we investigate the proton and its constituents through the pion cloud model. The pion cloud model depends on the splitting function, $f_{\pi B}(y)$, which represents the probability of a proton splitting into a pion and a baryon, and the pion parton distribution function, $q_\pi(z)$. The goal of our research is to examine the way the proton antiquark distributions depend on $q_\pi(z)$ and the form factors and cutoffs of $f_{\pi B}(y)$. We have studied functional forms for the dbar and ubar quarks given by the Durham HepData Project, compared their difference and ratio to the E866 experimental data from FermiLab and have studied a simplified pion cloud model. For Henley and Miller's $f_{\pi N}(y)$ we show how different $q_\pi(z)$ affect the proton antiquark distribution. We consider the pion parton distribution function of Sutton et al., as well as Aicher et al., and other forms of $q_\pi(z)$.

[1]Supported in part by NSF Grant No. 0855656, the Peach Foundation, and the Saudi Arabian Cultural Mission.

Kayla Furukawa
Seattle University

Date submitted: 27 Jul 2012 Electronic form version 1.4