Transverse distributions of the pion cloud of the proton[1] MARY ALBERG, ETHAN PURCELL, ENRIQUE SANCHEZ, MACQUARRIE THOMSON, Seattle University — The pion cloud of a proton is generated by its fluctuations into pion/baryon pairs. For fast-moving protons, this cloud is contracted into a disk transverse to the proton's longitudinal momentum. We construct a two-body light cone wave function $\psi(y, k_\perp)$ to represent a fluctuation in which a pion has longitudinal momentum fraction y and transverse momentum $k_\perp$. We then use a 2D Bessel transform to calculate the transverse spatial probability distribution $\rho_\pi(y, b)$ with b the transverse position coordinate. We compare our results to the expected spatial extent of the cloud, $\sim 1/m_\pi$, and to other theoretical transverse spatial distributions.

Mary Alberg
Seattle Univ

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