Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

Graphical Methods for Separating Beam and Target Fragmentation Regions[1] J.T. LONDERGAN, Center for Exploration of Energy and Matter (CEEM), Indiana University, Bloomington, IN, 47408, V. MATHIEU, Dept of Physics, Indiana University; CEEM, Indiana University, A.P. SZCZEPANIAK, Dept of Physics, Indiana University; CEEM, Indiana University; Jefferson Laboratory, Newport News, VA, JOINT PHYSICS ANALYSIS CENTER COLLABORATION
— For reactions involving three or more final-state particles, graphical methods can help to elucidate the dominant reaction mechanism. Van Hove [1] introduced a longitudinal phase space plot, which categorizes reaction products in terms of their longitudinal moments. We review the construction of such plots, and show how they are useful in separating beam and target fragmentation regimes. We summarize the information that can be obtained from Van Hove plots, and use these plots to analyze reactions with three or four strongly-interacting particles in the final state. As an example, we apply these methods to simulated data for the reaction $\pi^- + p \to \pi^- + \eta\,(\eta^{'}) + p$. We show how cuts in the Van Hove plot can be utilized to isolate various two-body processes that contribute to this reaction. We also show how the dominant reaction processes change with the beam energy.

[1] L. Van Hove, Phys. Lett. B28, 429 (1969).

[1]VM and APS supported by US DOE, grants DE-AC05-06OR23177 and DE-FG0287-ER40365; JTL by NSF-PHY-1205019

J.T. Londergan
Center for Exploration of Energy and Matter (CEEM),
Indiana University, Bloomington, IN, 47408

Date submitted: 26 Jun 2015 Electronic form version 1.4