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Investigation of Hyperon Polarization in Preparation for ATLAS Lambda-b Data SARAH LUMPKINS, University of Oklahoma, HOMER NEAL, University of Michigan, CERN TEAM — The fact that inclusively produced hyperons are produced with significant polarization was first discovered at Fermilab about thirty years ago. This field of research has seen much experimental work since then, although theoretical understanding is still lacking. One mystery in particular that has eluded explanation is the shape of the lambda polarization vs. transverse momentum curve; the lambda polarization grows to a sizeable negative value for p_t up to around 1.0 GeV/c and then plateaus for the next 2 GeV/c. Currently, there are no polarization models which have been able to successfully account for all known hyperon polarization phenomena. My project surveys all high energy hyperon polarization data in an effort to develop a model that provides a comprehensive explanation of the data. Initial results of this project support a quasi-classical parton-parton scattering model in line with that developed by Neal and Nielsen in 1974 in explanation of high energy elastic proton-proton scattering data. This analysis of lower mass hyperons is crucial in preparation for anticipated data on lambda-b hyperon polarization in ATLAS; due to the much larger mass of the lambda-b hyperon, certain physical models predict even larger polarization effects for the lambda-b. Thus, future lambda-b studies have an even greater potential for providing insight into fundamental processes of nature.

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