

Extension of the LAQGSM03 Code to Describe Photo-Nuclear Reactions up to Tens of GeV

K. K. Gudima¹ and S. G. Mashnik²,

¹*Institute of Applied Physics, Academy of Science of Moldova, Kishinev, Moldova*

²*Los Alamos National Laboratory, Los Alamos, NM 87545, USA*

The initial version of the Los Alamos Quark-Gluon String Model (LAQGSM), just like its precursor, the Quark-Gluon String Model (QGSM), did not consider photonuclear reactions, while its 2003 version, LAQGSM03, describes such reactions only for energies up to about 1.5 GeV. This is not convenient when using our codes to solve problems for PRAD, NASA, and other high-energy applications or to analyze future high-energy measurements at the Thomas Jefferson National Accelerator Facility (CEBAF), where photons with much higher energy are created and need to be simulated with our event-generators in transport codes like MCNP6, MARS, MCNPX, and others. To address this problem, we have extended LAQGSM03 to describe photonuclear reactions at energies up to tens of GeV. We have incorporated 56 channels to consider γp elementary interactions during the cascade stage of reactions and 56 channels for γn interactions into LAQGSM03 and have tested the extended code referred to as LAQGSM03.01 on a number of measured high-energy photonuclear reactions. Here, we present the photonuclear reaction model of LAQGSM03.01 and show examples of its results compared with available experimental data.