

Abstract Submitted  
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**Independent-particle and independent-event calculations for 1.5 MeV/amu  $O^{8+}$ -Li collisions**<sup>1</sup> LASZLO GULYAS, Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI), NARIMAN KHAZAI, TOM KIRCHNER, York University — In a recent experiment, ionization in 1.5 MeV/amu  $O^{8+}$ -Li collisions was considered [1]. The measured spectra exhibit two distinct peaks, which were identified as being due to the removal of the  $2s$ - and the removal of one of the  $1s$ -electrons, respectively. Since a continuum-distorted wave with eikonal initial state (CDW-EIS) calculation for Li( $1s$ ) ionization did not agree with the measured electron-energy differential cross section associated with the second peak, it was concluded that it may be due to a two-electron excitation-ionization process not accounted for in the calculation. In order to test this interpretation we have combined single-particle CDW-EIS calculations for ionization with basis generator method calculations for excitation using both independent-particle and independent-event models. We find that the proposed two-electron process, in which a  $1s$  electron is promoted to an excited state while the  $2s$  electron is ionized, does contribute, but cannot fully explain the experimental cross section. Rather, one has to consider the sum of various processes in which a vacancy is created in the Li  $K$ -shell to obtain acceptable agreement with the data.

[1] D. Fischer *et al.*, Phys. Rev. Lett. **109**, 113202 (2012).

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