Mean-field description of B^{2+}-Ne collisions with active target and projectile electrons[1] TOM KIRCHNER, GERALD SCHENK, MARKO HORBATSCH, Department of Physics and Astronomy, York University, Toronto ON M3J1P3, Canada — We apply an independent electron model to study q-fold target charge state production in 25–600 keV/u B^{2+}- Ne collisions. Projectile and target electrons are treated on the same footing using a common potential and a single-determinant wave function for the combined system [1]. For the sake of comparison we also perform a reduced calculation in which the projectile electrons are frozen in their initial state. Results are compared with recent experimental and theoretical data for positive ion production as well as for Ne^{q+} production obtained in coincidence with an unchanged projectile charge state [2]. We find that the total cross sections obtained from our full calculation agree well with experiment for $q = 1, \ldots, 4$, while the reduced calculation produces pronounced discrepancies for $q \geq 2$. This suggests that the projectile electrons participate actively even in processes, in which the projectile charge state does not change. At the conference, we will demonstrate that direct projectile electron loss with and without simultaneous transfer of a target electron can explain the observed features.

[1] T. Kirchner and M. Horbatsch, Phys. Rev. A **63**, 062718 (2001)
[2] W. Wolff et al, Phys. Rev. A **84**, 042704 (2011)

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Date submitted: 13 Jun 2013   Electronic form version 1.4