Electron impact excitation of xenon[1] OLEG ZATSARINNY, KLAUS
BARTSCHAT, Drake University — We have used the B-spline R-matrix (close-coupling) method with non-orthogonal sets of orbitals [1] to calculate angle-integrated and angle-differential cross sections, as well as spin-polarization and coherence parameters for electron impact excitation of xenon. A total of 31 physical and two pseudo target states were included in the close-coupling expansion, with the latter chosen to account for the dipole polarizability of the ground state. Relativistic effects were accounted for perturbatively through the most important correction terms in the Breit-Pauli Hamiltonian. In light of the very complex structure of xenon, characterized by strong mixing of states with different principal configurations, the use of term-dependent one-electron orbitals was critical for obtaining an acceptable target description, which could still be used in the subsequent collision calculation. We are also in the process of developing a full-relativistic version of the computer code. The progress and the latest results will be reported at the conference.

[1] O. Zatsarinny, Comp. Phys. Commun. **174** (2006) 273.

Klaus Bartschat
Drake University

Date submitted: 18 Jun 2007   Electronic form version 1.4