Abstract Submitted
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Electron scattering from silicon[1] OLEG ZATSARINNY, KLAUS BARTSCHAT, Drake University, VIKTOR GEDEON, SERGEJ GEDEON, VLADIMIR LAZUR, ELIZABETH NAGY, Uzhgorod State University, Ukraine — The B-spline R-matrix method [1] is used to study electron collisions with neutral silicon over an energy range from threshold to 100 eV. The multiconfiguration Hartree-Fock method with non-orthogonal orbitals is employed for an accurate representation of the target wave functions. The close-coupling expansion includes 34 bound states of neutral silicon derived from the [Ne]$3s^2 3p^2$, $3s3p^3$, $3s^2 3p4s$, $3s^2 3p5s$, $3s^2 3p4p$, $3s^2 3p5p$, $3s^2 3p3d$, and $3s^2 3p4d$ configurations, plus seven pseudostates to fully account for the dipole polarizability of the ground state and the lowest three excited states. Results are presented for transitions from the $3s^2 3p^2\ ^3P$ ground state and the metastable $3s^2 3p^2\ ^1D$ and $3s^2 3p^2\ ^1S$ states. Both correlation and polarization effects are found to be important for accurate calculations. The sensitivity of the results was checked by comparing data obtained in different approximations. The current predictions represent an extensive set of electron scattering data for neutral silicon. The results are compared with those obtained earlier for e-C collisions [2].

[1] O. Zatsarinny, Comp. Phys. Commun. **174** (2006) 273.
[2] O. Zatsarinny, K. Bartschat, L. Bandurina, and V. Gedeon, Phys. Rev. A bf 71 (2005) 042702.

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