Classical simulations of collisions between light particles

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The classical trajectory Monte Carlo (CTMC) method is quite successful in dealing with ionization, capture and excitation processes in ion-atom and in ion–molecular collisions. In the last decades a Software package of the classical trajectory Monte Carlo (CTMC) codes using 3-4-5 and many-body systems was developed.
Collisional radiative models used in the modeling of beam emission spectroscopy diagnostics recently neglect the atom-atom collisions due to a lack of these atomic cross section data. Filling this scantiness we performed a classical trajectory Monte Carlo simulations to calculate the cross sections for various channels in collisions between $H + H_2$, $Li + H_2$ and $Li^+ + N_2$ in wide range of projectile energies. I show simulation results for various cross sections from the total till the multi-differential ones of these systems. The results of the simulations will be compared with other theoretical and available experimental data.

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