Long-range interactions between Rydberg atoms

Wed, 2018-01-31 11:23 - Secretary-XUV [1] **Date:** 2016-09-22
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Reference:
Phys. Scr. 91, 104007

URL:
https://doi.org/10.1088/0031-8949/91/10/104007 [2]

We present an overview over theoretical models to describe adiabatic potential-energy curves, experimental excitation spectra, and electronic and nuclear dynamics in interacting Rydberg-atom pairs at large internuclear separations. The potential-energy curves and molecular wavefunctions are determined from the multipole expansion of the static Coulomb interaction which is evaluated numerically in a product basis of atomic orbitals. The convergence of this approach both in the truncation of the multipole expansion as well as in the size of the product basis is discussed, and the comparison of simulated excitation spectra is established as a useful criterium to test the convergence of the calculation. We finally discuss the dynamics of electronic and nuclear motions of pairs of Rydberg atoms, focusing on the stability of ultralong range Rydberg molecules with respect to autoionization.

- H2020 [3]
- RySQ [4]
- Result [5]
- 15.10.Ry Rydberg atoms [6]

Links:
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