

Forces beyond 2nd Order with Electromagnetic Response Theory

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An overview on calculations of atom-surface interactions is given, with an emphasis on the role of response functions: polarisabilities and surface reflection amplitudes. It is shown how the interaction energy can be mapped to radiation problems in classical macroscopic electrodynamics. Examples are worked out with nontrivial scattering from a composite surface. Processes beyond second order in perturbation theory are discussed with applications for matter-wave diffraction and friction forces.