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Study of ground state optical transfer for ultracold alkali dimers¹ NADIA BOULOUFA-MAAFA, Laboratoire Aime Cotton, CNRS, Univ. Paris-Sud. ENS Cachan, Orsay, BEATRIZ LONDONO, Facultad de Ciencias, Universidad Antonio Nariño, Carrera 3 Este No 47A-15, Bogotá, Colombia, DIMITRI BOR-SALINO, ROMAIN VEXIAU, Laboratoire Aime Cotton, CNRS, Univ. Paris-Sud, ENS Cachan, Orsay, JORGE E. MAHECHA, Instituto de física, Universidad de Antioquia, Calle 67 No 53-108, AA 1226, Medellín, Colombia, OLIVIER DULIEU, ELIANE LUC-KOENIG, Laboratoire Aime Cotton, CNRS, Univ. Paris-Sud, ENS Cachan, Orsay — Control of molecular states by laser pulses offer promising potential applications. The manipulation of molecules by external fields requires precise knowledge of the molecular structure. Our motivation is to perform a detailed analysis of the spectroscopic properties of alkali dimers, with the aim to determine efficient optical paths to form molecules in the absolute ground state and to determine the optimal parameters of the optical lattices where those molecules are manipulated to avoid losses by collisions. To this end, we use state of the art molecular potentials, R-dependent spin-orbit coupling and transition dipole moment to perform our calculations. R-dependent SO coupling are of crucial importance because the transitions occur at internuclear distances where they are affected by this R-dependence. Efficient schemes to transfer RbCs [1], KRb and KCs to the absolute ground state as well as the optimal parameters of the optical lattices will be presented.

[1] M. Debatin, et al., Phys. Chem. Chem. Phys., 13, 18926 (2011)

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