Abstract Submitted
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Theory of long-range photoassociation of ultracold atoms with ultracold molecules[1] OLIVIER DULIEU, JESUS PEREZ-RIOS, MAXENCE LEPERS, Laboratoire Aime Cotton, CNRS, Univ. Paris-Sud, ENS Cachan, Orsay — We present a dynamical model for photoassociation (PA) of ultracold alkali atoms with ultracold alkali molecules in their rovibrational ground state to create excited trimer molecules. The model involves the long-range multipolar interactions between the atom and the molecule calculated with the degenerate perturbation theory [1], connected to an arbitrary short-range potential. The rate is found significantly smaller than in the atom-atom case under typical MOT conditions, but is promising in the nanokelvin domain. We design a proposal for an experiment in the Mott insulator regime. Being a half-collision, PA could offer the possibility to probe the complex short-range dynamics along the lines developed in refs [2, 3].

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Olivier Dulieu
Laboratoire Aime Cotton, CNRS, Univ. Paris-Sud, ENS Cachan, Orsay

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