Theory of photoassociation of ultra-cold trimers[1] VIATCHESLAV
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Cotton, U Paris-XI, CNRS, Orsay — We present a general theory for the formation
of ultracold trimers by photoassociation from an excited atom and a ground state
diatomic molecule in an ultracold mixed gas containing atoms and molecules. The
excited atom has a non-zero quadrupole moment, and interacts with the dimer by
a quadrupole-quadrupole long-range interaction, which is attractive enough to bind
trimers. We have also applied the general formalism for the multipole and dispersion
asymptotic interactions to the calculation of long-range coefficients of interaction
between an alkali atom (Li or Cs) in its ground or its first excited state and a
molecule (Li_2 or Cs_2) in an excited rotational state. The suggested photoassociation
theory can easily be generalized to the formation of tetramers from identical dimers
by an RF field.

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