

Abstract Submitted  
for the DAMOP18 Meeting of  
The American Physical Society

**Optical fields to control ultracold atomic molecular collisions** NADIA BOULOUBA-MAAFA, ANDREA ORBAN, OLIVIER DULIEU, laboratoire Aime Cotton, CNRS, Universite Paris-Sud, ENS Paris Saclay, Universit Paris-Saclay, 91405 Orsay (France) — Research focusing on the formation of ultracold atomic and molecular quantum gases is a continuously expanding field due to its envisioned applications such as quantum-controlled chemistry or quantum simulation. The aim of our theoretical work is to find ways to suppress inelastic or reactive processes between colliding particles in ultracold quantum gases. Using a laser field detuned to the blue of a relevant transition, we propose to couple the initial colliding particle state to a repulsive excited one, thus preventing the particles to come close to each other. This “blueshielding” technique is applied for ultracold quantum gases, close to quantum degeneracy. Due to the extremely small collisional energies it is possible to address a single repulsive channel thus ensuring a full control of the suppression efficiency. We will present our results in case of the  $^{39}\text{K}^{133}\text{Cs}$  molecule. [1] A. Orban.et al. Phys. Rev. A, **92**, 265 (2015). [2] A. Orban.et al. Phys. Rev. A, **92**, 265 (2015).

Nadia Bouloufa-Maafa  
Universite Paris-Sud

Date submitted: 08 Feb 2018

Electronic form version 1.4