

### **Theory of Radiative-Stark Mixing at Ultra-Cold Energies\***

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Slow collisions of heavily charged ions with an excited atom at large impact parameters lead to  $\ell$ -changing transitions within the degenerate states of a given energy shell  $n$ . An exact analytical (quantal and classical) treatment of this Stark mixing induced via the ion-dipole interaction in the slow collision between an ion and a hydrogenic target has already been provided [1,2]. Any excited atom is always coupled to zero-point fluctuations of the radiation field. Because the collisional timescales are comparable to time for radiative decay, it becomes important at ultralow energies to incorporate the radiative decay effect into the theory of Stark mixing. Collisional Stark mixing coupled with radiative decay, can be termed *Radiative-Stark mixing*. In this paper, we shall present the theory of Radiative-Stark mixing and shall illustrate the effects of the coupling.

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[2] M. R. Flannery and D. Vrinceanu, Int. Journ. Mass Spectrom. **223-224** (2003), pp. 473-489