

Abstract Submitted
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The effect of DC electric fields on nP cold Rydberg collisions¹

JORGE KONDO, JADER CABRAL, LUIS GONÇALVES, LUIS MARCASSA, Universidade de São Paulo, DONALD BOOTH, JAMES SHAFFER, University of Oklahoma — We have investigated the role of the dc Stark effect on population transfer to the nS state 100 ns after the excitation of nP Rydberg atoms in a Rb magneto-optical trap (MOT) for $32 \leq n \leq 36$. The nS population was measured as a function of the principal quantum number, as a function of the dc electric field, and as a function of the nP atomic density. The time evolution of the nS population was also measured up to 10 μ s after the nP+nP state excitation. The electric fields are scanned through the Forster resonance between 0 and 12 V/cm. The experimental results are compared to a theoretical model to calculate the probability of a transfer of population between the two states, taking into account dipole-dipole, dipole-quadrupole, and quadrupole-quadrupole interactions as well as the dc Stark effect. We should stress that the nP case is simpler than our previous work involving nD+nD states [1], since there are fewer potential curves involved in the process.

[1] J S Cabral *et al.*, New J. Phys. **12**, 093023 (2010).

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