

Abstract Submitted  
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**Electric field effects on decay of Rb Rydberg atom pairs**<sup>1</sup> DONALD BOOTH, JONATHAN TALLANT, ARNE SCHWETTMANN, JAMES SHAFFER, University of Oklahoma, JADER CABRAL, JORGE KONDO, LUIS GONÇALVES, LUIS MARCASSA, Universidade de São Paulo — We discuss the effects of the dc Stark effect on the decay of pairs of Rb Rydberg atoms. The decay of  $nD+nD$  Rydberg pair states, where  $29 \leq n \leq 41$ , is observed by measuring the  $(n+2)P$  atomic products after a delay of 100 ns following their excitation in a Rb MOT. The background dc electric field has a significant effect on the decay of these pairs. The experimental results are compared to theoretical calculations which use the Landau-Zener approximation 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. The experimental results rule out the possibility of free atom collisions being responsible for the transfer of population. The results show agreement with a model of non-adiabatic decay from the  $nD+nD$  state, and suggests that, rather than being the results of free-atom collisions, the pairs are excited directly.

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