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Catalysis of Forster Resonances in Rubidium A.L. WIN, W.D. WILLIAMS[1], C.I. SUKENIK, Department of Physics, Old Dominion University, Norfolk, VA — When two ultracold Rydberg atoms collide they may change their quantum state if the total electronic energy of the two atoms before and after the collision is about the same. This process can be made resonant by tuning the energy levels of the atoms with an electric field, via the Stark shift, so that the energy difference between incoming and outgoing channels vanishes. This condition is known as a Forster resonance. We have studied a particular Forster resonance in rubidium: 34p + 34p $\rightarrow$ 34s + 35s, by investigating the time dependence of the state change in an ultracold environment. Furthermore, we have added 34d state atoms to the mix and observed an enhancement of 34s atom production. We attribute this enhancement to a catalysis effect whereby the 34d atoms alter the spatial distribution of 34p atoms that participate in the energy transfer interaction. We will present results from the experiment and compare them to model calculations.

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