Abstract Submitted
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Spin-Interaction Effects for Ultralong-range Rydberg Molecules in a Magnetic Field CHRISTIAN FEY, FREDERIC HUMMEL, Center for Optical Quantum Technologies, University of Hamburg, Germany, PETER SCHMELCHER, Center for Optical Quantum Technologies, The Hamburg Centre for Ultrafast Imaging, University of Hamburg, Germany — Ultralong-range Rydberg molecules (ULRM) are "giant molecules" consisting of a Rydberg atom and one or more polarizable ground state atoms [1,2]. The Born-Oppenheimer potential surfaces of these molecules mimic the oscillatory structure of the Rydberg wave function and are therefore extremely sensitive to weak external fields. This property can be exploited to control the molecular geometry, e.g. to orient the molecular axis relative to a given magnetic field axis [3,4]. On our poster we will focus on the role of different spin couplings for the formation of Rb d-state ULRM in magnetic fields, e.g. the relative configuration of the Rydberg spin and the electronic spins of the ground state atoms (singlet vs. triplet) or the hyperfine configurations. We'll see that the magnetic field offers possibilities to create a large variety of molecular states in different spin configurations as well as in different spatial arrangements [5]. [1] Greene, Dickinson, Sadeghpour, PRL 85, 2458 (2000). [2] Bendkowsky, Butscher, Nipper, Shaffer, Löw, Pfau, Nature 458, 1005 (2009). [3] Kurz, Schmelcher, J. Phys. B 47 165101 (2014). [4] Krupp, Gaj, Balewski, Ilzhöfer, Hofferberth, Löw, Pfau, Kurz, Schmelcher, PRL 112, 143008 (2014). [5] Hummel, Fey, Schmelcher, arxiv 1711.08748

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