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Overflow of a dipolar exciton trap at high magnetic fields[1] SEBASTIAN DIETL, WSI and Physics Department, TUM, 85748 Garching, Germany, KATARZYNA KOWALIK-SEIDL, LUKAS HAMMER, Fakultät fr Physik, LMU, 80539 München, Germany, DIETER SCHUH, Institute of Exp. and Appl. Physics, Univ. of Regensburg, 93040 Regensburg, Germany, WERNER WEGSCHEIDER, Solid State Physics Laboratory, ETH Zurich, 8093 Zurich, Switzerland, ALEXANDER HOLLEITNER, URSULA WURSTBAUER, WSI and Physics Department, TUM, 85748 Garching, Germany — We study the photoluminescence of trapped dipolar excitons (IX) in coupled double GaAs quantum wells at low temperatures and high magnetic fields. A voltage-tunable electrode geometry controls the strength of the quantum confined Stark effect and defines the lateral trapping potential. Furthermore, it enhances the IX lifetime, enabling them to cool down to lattice temperature. We show that a magnetic field in Faraday configuration effectively prevents the escape of unbound photogenerated charge carriers from the trap area, thus increasing the density of dipolar excitons. For large magnetic fields, we observe an overflow of the IX trap and an effectively suppressed quantum confined Stark effect.

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