Abstract Submitted
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Localized charged magnetoexcitons in 2D systems[1] DIANA COSMA, ALEXANDER TODD, ALEXANDER DZYUBENKO, CSU Bakersfield, Bakersfield, CA93311, ANDREY SIVACHENKO, Ariadne Genomics Inc., Rockville, MD 20850 — We performed a detailed theoretical study of localization of spin-singlet X_s^- and spin-triplet X_t^- negatively charged excitons on isolated charged donors D^+ located at various distances L from the heteroboundary of a Quantum Well (QW). Our results show that the parent bright singlet state X_s^- remains always bound. In contrast, the dark X_{td}^- and bright X_{tb}^- triplet states survive only for sufficiently large distances L to the donor ion D^+. In the presence of the D^+ the dark triplet acquires finite oscillator strengths. We also found several new bound X^- states, some of which have surprisingly large oscillator strengths. We showed that shake-up processes are strictly prohibited in magneto-photoluminescence of free charged excitons and only become allowed in the presence of a D^+ or other symmetry-breaking mechanisms. Our results show that the main magneto-PL peaks of free and donor bound charged excitons may exhibit very similar features while the shake-up processes in PL are symmetry-breaking signatures.

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