Magneto-optical properties of Van-der-Waals Exciton-Polaritons

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Two dimensional materials have emerged as a new and interesting platform for studies of tightly bound exciton in ultimately thin materials. Meanwhile, various types of 2D- or quasi 2D materials have become available that feature giant light-matter interactions, charge tunability, and intriguing magnetic and topological properties. These features can be exploited for implementing novel photonic devices, and for fundamental, as well as quantum photonic investigations in the framework of cavity quantum electrodynamics [1].

I will discuss the implementation of our open optical cavity in a liquid-helium-free magneto-optical cryostat [2]. It is ideally suited for the study of exciton-polaritons based on van-der-Waals materials, even in most complex geometries. I will address examples of such experiments, with a focus on magnetic-optical properties [3] of charge-correlated exciton-polaritons in the regime of strong light-matter interaction in moiré lattices [4] as well as in the van-der-Waals magnet CrSBr [5].

References

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