# Quantum Nature of Interaction between Two Spin States of Interlayer Excitons in a TMDC Heterostructure

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Abstract

Although the temporal coherence of interlayer excitons in transition metal dichalcogenide (TMDC) heterobilayers has been studied in recent years [1,2], the coherence properties of individual spin states of interlayer excitons and the nature of the interaction between those states remained elusive until our recent work [3].

In this talk, I will discuss the nature of the coupling between spin-singlet and spin-triplet interlayer excitons in a $WSe_2$-$MoSe_2$ heterobilayer and present the formation of a quantum beat pattern as a hallmark of coherent coupling via quantum beat spectroscopy [3].

References

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[2] Sigl, L. et al., Physical Review Research, **2** (2020) 042044(R)
[3] Mehmet Atıf Durmuş and Ibrahim Sarpkaya, Nano Letters, **24** (2024) 5767-5773