

# Room-Temperature Dilute Magnetic Semiconductor in V-doped Monolayer WSe<sub>2</sub>

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Diluted magnetic semiconductors (DMSs) such as Mn-doped GaAs are attractive materials for gate-controlled spintronic devices but the low Currie temperature of the ferromagnetic order is far from room temperature, limiting for practical applications. In this talk, research challenges of DMSs will be reviewed. I will present our unambiguous observations of the long range ferromagnetic order occurring above room temperature in diluted V-doped mono layer WSe<sub>2</sub>. Magnetic hysteresis curves, micro magnetic domains and the well-defined structure of V-substituted W atoms are characterized by the vibrating sample magnetometer, magnetic force microscopy and high-resolution transmission electron microscopy, respectively. The possible mechanism of such high transition temperature in V-doped WSe<sub>2</sub> will be introduced by our band structure calculations based on density functional theory.

## References

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