

Transition metal dichalcogenides

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1 Structural information

TMDs are interesting in both bulk forms and monolayer forms. Frequently seen phases:

- 1T phase (inversion symmetry)
- 1T' phase (inversion symmetry? terminological confusion)
- H phase (*no* inversion symmetry)

2 Valley electronics

Experimental setting:

- Monolayer form \Rightarrow 1BZ easy to illustrate
- 1H phase
 - Graphene-like structure (assuming tight-binding model works) \Rightarrow valleys
 - no inversion symmetry, only time reversal symmetry $\Rightarrow \Omega(\mathbf{k}) = -\Omega(-\mathbf{k}) \neq 0 \Rightarrow$ effective magnetic field (modified quantum Boltzmann equation needed)