\textbf{k·p theory for two-dimensional transition metal dichalcogenide semiconductors} ANDOR KORMANYOS, GUIDO BURKARD, University of Konstanz — We present \textit{k·p} Hamiltonians (for a review see [1]) parametrised by \textit{ab initio} density functional theory calculations to describe the dispersion of the valence and conduction bands at their extrema (the $K$, $Q$, $\Gamma$, and $M$ points of the hexagonal Brillouin zone) in atomic crystals of semiconducting monolayer transition metal dichalcogenides. We review the parametrisation of the essential parts of the \textit{k·p} Hamiltonians for MoS$_2$, MoSe$_2$, WS$_2$, and WSe$_2$, including the spin-splitting and spin-polarisation of the bands. We use \textit{k·p} theory to analyse: i) optical transitions in two-dimensional transition metal dichalcogenides over a broad spectral range; ii) to discuss magnetotransport properties of the charge carriers in the $K$ and $-K$ valleys.


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