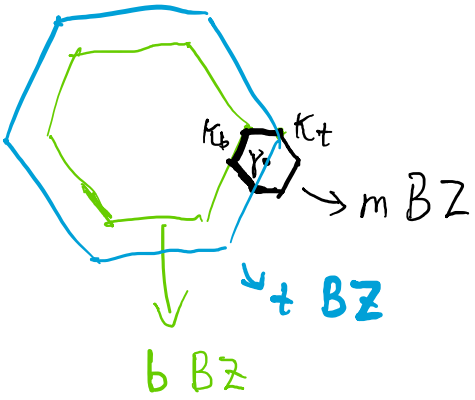
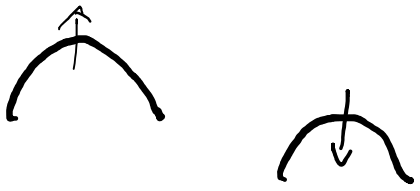
k - space



k - valley

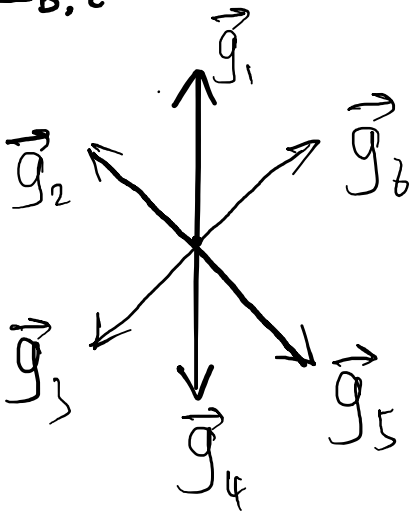


$MoTe_2$ WSe_2

$$\begin{cases} \vec{K}_b = \frac{4\pi}{3a_M}\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right) \\ \vec{K}_t = \frac{4\pi}{3a_M}\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right) \end{cases}$$

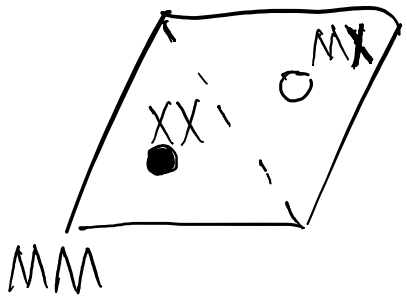
$$H = \begin{pmatrix} -\frac{\hbar^2(\vec{k}-\vec{K}_b)^2}{2m_b} + \Delta_b(\vec{r}) & \Delta_T(\vec{r}) \\ \Delta_T^{\dagger}(\vec{r}) & -\frac{\hbar^2(\vec{k}-\vec{K}_t)^2}{2m_t} + \Delta_t(\vec{r}) \end{pmatrix}$$

$$\Delta_{b,t}(\vec{r}) = 2V_{b,t}\sum_{j=1,3,5}\cos(\vec{g}_j\cdot\vec{r} + \psi_{b,t}) + V_{b,t}^{(0)}$$



$$\Delta_T(\vec{r}) = w\left(1 + e^{i\frac{2\pi}{3}}e^{i\vec{g}_2\cdot\vec{r}} + e^{i\frac{4\pi}{3}}e^{i\vec{g}_3\cdot\vec{r}}\right)$$

real-space



$$\Delta_T(\vec{r}) = \begin{cases} 0 & MM \\ 3W & XX \\ 0 & MX \end{cases}$$