PL change as the mganetic field is scanned in the [111] direction

NV-NV

NV-LAC Shoulders

Ns-NV

LAC

$\vec{B}$

[111] Direction :

1 class aligned with $\vec{B}$

3 classes misaligned

$|0\rangle \to |+1\rangle$ NV

$|-1/2\rangle \to |+1/2\rangle$ P1

$|0\rangle \to |-1\rangle$ NV

$$\mathbf{B} \cdot \hat{\mathbf{S}} = B_{\parallel} S_{\parallel} + B_{\perp} S_{\perp}$$

$B_{\parallel} S_{\parallel}$: Zeeman splitting

$B_{\perp} S_{\perp}$: Mixing of the eigenstates
$\to$ Loss of polarization