

**Abstract :** The nitrogen-vacancy center's spin is a powerful sensor used in a large variety of applications. Here we use Cross-Relaxations (C.R.) to detect the presence of dark spins ( $\text{VH}^-$  and WAR1) in CVD-grown diamond. We also managed to mechanically detect cross-relaxations between two classes of NV centers by measuring the torque applied on a levitating diamond.