

Searching for exotic spin-dependent interactions by diamond quantum sensors

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Searching for physics beyond the standard model is crucial for understanding several fundamental conundrums in physics and astrophysics. Several hypothetical particles can mediate exotic spin-dependent interactions between ordinary fermions, which enable laboratory searches via the detection of the interactions. We present a platform based on diamond quantum sensors for investigating exotic spin-dependent interactions at micrometer scales. I will discuss one recent result which is to conduct experimental searches for exotic spin-dependent interactions with an ensemble-NV-diamond magnetometer. Our work shows that NV ensembles are highly capable of probing exotic spin-spin interactions beyond the Standard Model.

Primary author(s) : Prof. RONG, Xing

Presenter(s) : Prof. RONG, Xing