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Development and optimisation of diamond for quantum technologies

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Abstract

Quantum technologies is attracting significant investment due to the range of potential applications, but behind any new technology are the enabling materials. Diamond is one such material and ensembles of negatively-charged nitrogen-vacancy (NV-) centres constitutes a promising platform for sensing applications utilizing the quantum properties of this defect. However, the sensitivity of present NV-ensemble devices and the need for diamond material with reproducible properties has the potential to hinder progress toward many envisioned commercial-scale applications. The work covered in this presentation will address the material-related challenges associated with the development of diamond materials with reproducible properties for diamond quantum technologies.