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Quantum Sensing for Dark Matter and Gravitational Waves

Searches for wave-like dark matter can benefit from efforts to develop experimental sensitivity beyond the Standard Quantum Limit. In particular, RF cavity experiments and spin magnetometers are promising technologies in this endeavour. In recent years, it has been shown that experiments of this kind can also be sensitive to high-frequency gravitational waves. As part of the community input to the European Strategy for Particle Physics 2026 update, we report on the activities and plans of some experimental and theoretical groups aiming to search for dark matter (and gravitational wave) signals beyond the Standard Quantum limit. Our report is not exhaustive in cataloging the efforts of experimental or theoretical groups in Europe, but presents the current status and plans of the CASPEr, GNOME, GravNet, MAGO, RADES and SRF Heterodyne collaborations.

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