

Detection of a single cobalt microparticle with a microfabricated atomic magnetometer

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We present magnetic detection of a single, $2\ \mu\text{m}$ diameter cobalt microparticle using an atomic magnetometer based on a microfabricated vapor cell. These results represent an improvement by a factor of 105 in terms of the detected magnetic moment over previous work using atomic magnetometers to detect magnetic microparticles. The improved sensitivity is due largely to the use of small vapor cells. In an optimized setup, we predict detection limits of $0.17\ \mu\text{m}^3$.

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