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Zero-field optically pumped magnetometer with thin vapor cell and 16 channels

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We present a zero-field optically pumped magnetometer that utilizes a thin microfabricated vapor cell, offering 16 measurement channels within the same cell. The vapor cell and its thermal insulation have been optimized to minimize the distance between the magnetic sample and the sensing volume, thereby enhancing the effective spatial resolution. Initial measurements indicate that all channels achieve a photon-shot-noise limited noise floor in the $\frac{pT}{\sqrt{\text{Hz}}}$ range for a sensitive voxel size of approximately $600\text{ }\mu\text{m} \times 600\text{ }\mu\text{m} \times 200\text{ }\mu\text{m}$. The best channel reached $1.4 \frac{pT}{\sqrt{\text{Hz}}}$ noise floor.

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