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Probing the magnetic order in a few-layer CrPS₄

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Understanding magnetism in two-dimensional (2D) van der Waals (vdW) magnets requires nanoscale local probes. Scanning SQUID microscopy (SSM), with ~100 nm resolution, enables direct imaging of magnetic structures in mono- and few-layer materials. Using SSM, we investigate the magnetic behavior of CrPS₄, a weakly anisotropic vdW interlayer antiferromagnet. Monolayer CrPS₄ shows no remanence and a zero coercive field, unlike thicker odd layers that exhibit 20–50 mT coercivity and nearly 100% remanence. Layer-dependent studies reveal that interlayer coupling and dimensionality govern magnetic responses. These findings provide insight into mechanisms driving long-range magnetic order in 2D.

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