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Optimizing Bismuth Hall Probe Performance RICKY CHU, Simon Fraser University, NIGEL DAVID, TARAS CHOUINARD, ADAM SCHNEIDER, DAVID BROUN — Scanning Hall probe microscopy is a quantitative magnetic imaging technique that combines high spatial resolution with high flux sensitivity, occupying a unique niche in magnetic microscopy [S.J. Bending, Adv. Phys. **48**, 449 (1999)]. Hall sensors are useful in studying materials with microscopic or nanoscale magnetic structures, like high temperature superconductors and magnetic thin films. Development of conventional semiconductor Hall sensors has run into charge depletion and excess noise problems. Sandhu recently introduced bismuth Hall probes in an effort to avoid these effects [A. Sandhu *et al.* Jpn. J. Appl. Phys. **40**, L524 (2001)]. The bismuth probes lack a good model to optimize their performance. I will propose a refinement of the current model with an increased emphasis on material parameters that can be more intuitively manipulated. I will compare the spatial and flux resolution predicted by the refined model with those of my nanoscale bismuth Hall sensors at different dopings.

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