Magnetic properties of the topologically non-trivial compound $CaMnSb_2$

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$CaMnSb_2$ is a layered transition-metal pnictide, which crystalizes in the orthorhombic structure, space group *Pnma* [1]. Previous magnetic measurements [2] provided evidence of distinct anisotropy with magnetic easy direction along the *a* axis and antiferromagnetic (AFM) order below $T_N = 302$ K. It was also suggested that $CaMnSb_2$ hosts nearly massless Dirac fermions, which give rise to nonzero Berry phase, high carrier mobility, and very small cyclotron masses derived from de Haas–van Alphen (dHvA) oscillations. In the present study, we extended magnetic characterization of single-crystalline $CaMnSb_2$ up to 750 K. The results clearly indicated that the AFM ordering sets in much above the room temperature. At $T = 2$ K, we observed dHvA effect that corroborated the previous findings. Moreover, we performed angle- dependent magnetic torque measurements, which provided new insight into interplay of magneto-crystalline anisotropy and the AFM exchange interactions.

References:

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