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Surface Effects In Chiral Magnets NIKOLAI S. KISELEV, Forschungszentrum Jülich, D-52425 Jülich, Germany, F. N. RYBAKOV, A. B. BORISOV, Institute of Metal Physics, Ekaterinburg 620990, Russia, S. BLÜGEL, Forschungszentrum Jülich, D-52425 Jülich, Germany — We theoretically studied a general 3D model of a chiral magnet revealing a variety of unusual localized magnetic states appearing near the free edges of the sample. In particular, we present a recently discovered new type of thermodynamically stable magnetic quasi-particle, which appears at interfaces and surfaces of isotropic chiral magnets [Phys. Rev. Lett. **115**, 117201 (2015)]. We use the term chiral bobber (CB) to refer to it. The CB constitute a new class of hybrid particles composed of a smooth magnetization field and a magnetic singularity. Comparing the stability and dynamical properties of CB with ordinary magnetic skyrmions, we conclude that CB can be considered as promising object not only for fundamental research but also for various practical applications in spintronic devices. We predict the existence of such surface states in different B20-type alloys. Moreover, we have calculated the phase diagram of magnetic states for film geometry in applied magnetic field [New J. Phys. **18**, 045002 (2016)], where we have found a novel magnetic ground state localized at the surface of the sample and stacked on top of the conical bulk phase. It can be considered as a superposition of helical and cycloidal spin spirals.

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