Abstract Submitted
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Spin waves in a skyrmion crystal[1] OLGA PETROVA, OLEG TCHERNYSHYOV, Johns Hopkins University — We derive the spectrum of low-frequency spin waves in skyrmion crystals observed recently in noncentrosymmetric ferromagnets [1-4]. We treat the skyrmion crystal as a superposition of three helices whose wavevectors form an equilateral triangle [1]. The low-frequency spin waves are Goldstone modes associated with displacements of skyrmions. Their dispersion is determined by the elastic properties of the skyrmion crystal and by the kinetic terms of the effective Lagrangian, which include both kinetic energy and a Berry phase term reflecting a non-trivial topology of magnetization. The Berry phase term acts like an effective magnetic field, mixing longitudinal and transverse vibrations into a gapped cyclotron mode and a twist wave with a quadratic dispersion [5].

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