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A second species of spinons in the $S = 1/2$ Heisenberg antiferromagnet on kagome[1] PAULA MELLADO, ZHIHAO HAO, OLEG TCHERNYSHYOV, Johns Hopkins University — The $S = 1/2$ Heisenberg model on kagome can be viewed as an ensemble of spinons, fermionic quasiparticles with $S = 1/2$ bound into small, heavy pairs whose binding energy sets the spin gap [1]. The apparent lack of a spin gap in real kagome magnets (e.g. herbertsmithite) may be associated with the Dzyaloshinskii-Moriya (DM) term $\mathbf{D} \cdot (\mathbf{S_i} \times \mathbf{S_j})$ in the Hamiltonian allowed by lattice symmetry. The DM term suppresses the spin gap and eventually induces long-range magnetic order [2]. A recent study [3] hints at the presence of an intermediate gapless phase without magnetic order. We propose that this phase arises as a result of condensation of a second spinon species (kinks). Here we study the motion of a single kink on the Husimi cactus, the analog of kagome in a hyperbolic plane. The kink is localized in the pure Heisenberg model and becomes mobile when $D \neq 0$. We calculate the one-particle density of states and the bandwidth. [1] Z. Hao and O. Tchernyshyov, Phys. Rev. Lett. **103,** 187203 (2009). [2] O. Cépas *et al.*, Phys. Rev. B 78, 140405 (2008). [3] I. Rousochatzakis *et al.*, Phys. Rev. B **79,** 214415 (2009).

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