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Interface currents in topological superconductor-ferromagnet junctions PHILIP BRYDON, CARSTEN TIMM, Technische Universität Dresden, ANDREAS SCHNYDER, Max-Planck-Institut für Festkörperforschung — Both fully gapped and nodal pairing states of noncentrosymmetric superconductors (NCS) display non-trivial topological properties, manifested by topologically protected dispersing and flat-band surface states [1,2]. Using a 2D model of an NCS, we show that the surface states typically have strong spin-polarization $s_{\mu=x,z}(k_y)$, which is odd in the surface-Brillouin-zone momentum k_y. Upon placing the NCS in proximity contact with a ferromagnet, the coupling to the exchange field gives a perturbative correction to the energy of these states $\propto s_\mu(k_y)$, thus generating an interface charge current $\propto \partial_{k_y} s_\mu(k_y)$ in the NCS. This is most clearly realized in a nodal NCS, where the weak dispersion acquired by the singly degenerate zero-energy flat bands leads to a strong enhancement of the interface current at low temperatures. We argue that this effect is a "smoking-gun" signature of the singly degenerate flat bands.

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[2] P. M. R. Brydon, A. P. Schnyder, and C. Timm, Phys. Rev. B **84**, 020501(R) (2011); A. P. Schnyder, P. M. R. Brydon, and C. Timm, Phys. Rev. B **85**, 024522 (2012).

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