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**Phonon analogue of topological nodal semimetals** HOI CHUN PO, YASAMAN BAHRI, ASHVIN VISHWANATH, Univ of California - Berkeley — Recently, Kane and Lubensky proposed a mapping between bosonic phonon problems on isostatic lattices to chiral fermion systems based on factorization of the dynamical matrix [Nat. Phys. **10**, 39 (2014)]. The existence of topologically protected zero modes in such mechanical problems is related to their presence in the fermionic system and is dictated by a local index theorem. Here we adopt the proposed mapping to construct a two-dimensional mechanical analogue of a fermionic topological nodal semimetal that hosts a robust bulk node in its linearized phonon spectrum. Such topologically protected soft modes with tunable wavevector may be useful in designing mechanical structures with fault-tolerant properties.

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