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Secondary stability and periodicity for unordered configuration spaces.

Secondary stability is a stability pattern in a range that homological stability does not hold. The first example of secondary stability is Galatius–Kupers–Randal-Williams results on mapping class groups. We prove secondary stability for unordered configuration spaces of manifolds. The main difficulty is the closed case (the open case was previously known by some experts). In the closed case, there are no obvious stabilization maps and the homology does not stabilize but is periodic. We resolve this issue by constructing a chain-level stabilization map for configurations of closed manifolds. The main technical lemma involves describing obstructions for multiplication by an element of an E_n -algebra to be homotopic to a map of modules over the E_{n-1} -Hochschild chains of the E_n -algebra. (Received January 15, 2020)