Hamiltonian no-torsion

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In 2002 Polterovich notably showed that Hamiltonian diffeomorphisms of finite order, which we call Hamiltonian torsion, must be trivial on closed symplectically aspherical manifolds. We study the existence of Hamiltonian torsion and its metric rigidity properties in more general situations. First, we extend Polterovich's result to closed symplectically Calabi-Yau and closed negative monotone manifolds. Second, going beyond topological constraints, we describe how Hamiltonian torsion is related to the existence of pseudo-holomorphic spheres and answer a close variant of Problem 24 from the introductory monograph of McDuff-Salamon. Finally, we prove an analogue of Newman's theorem for Hofer's metric and Viterbo's spectral metric on the Hamiltonian group of monotone symplecitc manifolds: a sufficiently small ball around the identity contains no torsion. During the talk, I shall discuss the results above and some of the key ingredients of their proofs. This talk is based on joint work with Egor Shelukhin.