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Periodic diffeomorphisms with trivial quotient and a characterisation of the 3-sphere

The 3-sphere is the only integral homology sphere admitting four periodic diffeomorphisms with pairwise distinct odd prime orders and trivial quotient, *i.e.*, with space of orbits homeomorphic to $\mathbf{S}^3$. My talk will be devoted to the proof of this characterization of $\mathbf{S}^3$. I shall also discuss some applications to knots and their cyclic branched covers and some possible generalisations of the main result.

This is joint work with M. Boileau (Toulouse) and B. Zimmermann (Trieste).