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James F. Davis* (jfdavis@indiana.edu) and **Shmuel Weinberger**. *Mapping tori of self-homotopy equivalences of lens spaces.*

Here is a conjecture: If the mapping torus of a self-homotopy equivalence of a closed 3-manifold is homotopy equivalent to a closed 4-manifold, then the mapping torus is homotopy equivalent to a manifold which fibers over the circle.

We prove this conjecture in the case of a lens space.

As a consequence we answer a question of Jonathan Hillman and show that closed 4-manifold with Euler characteristic zero and fundamental group the semidirect product of a infinite cyclic group acting on a finite cyclic group has the homotopy type of a manifold with the geometry of $SO(3) \times \mathbb{R}$.

The methods involve rho invariants and surgery. (Received March 08, 2011)