962-57-1156   **Reinhard Schultz*** (`schultz@math.ucr.edu`), Department of Mathematics, University of California at Riverside, Riverside, CA 92521. *Exotic spheres with no smooth T^3 actions.* Preliminary report.

Given an odd prime p, there is an exotic sphere $\Sigma(p)$ of dimension $2p^2 - 2p - 2$ that does not bound a parallelizable manifold and represents the lowest dimensional element in the even dimensional Kervaire-Milnor group of homotopy spheres with order p. **Theorem.** *There are no effective smooth actions of the 3-torus T^3 on $\Sigma(p)$.* The proof involves invariants of torus actions on homotopy spheres previously constructed by the author and an Adams spectral sequence argument. The methods also yield exotic spheres in infinitely many dimensions for which the degree of symmetry is either 1 or 2. (Received October 02, 2000)