Dimension of homology spheres with odd number of A_6-fixed points

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Abstract

We call a smooth action of a finite group G on a smooth manifold M a **one** (resp. an **odd)-fixed-point action** if the G-fixed point set M^G consists of exactly one point (resp. odd-number of points). It was proven by E.Laitinen-M.Morimoto if a finite group G is an Oliver group, there exist one-fixed-point actions of G on spheres. However, dimension of spheres which admits one-fixed-point actions of G is restrictive. In fact, E.Stein showed that there exists a one-fixed-point action of $SL(2,5)$ on S^7. On the other hand, A.Borowiecka showed that there never exist one-fixed-point actions of $SL(2,5)$ on any $\mathbb{Z}$-homology sphere of dimension 8. In this talk, we discuss dimension of homology spheres not admitting odd-fixed-point actions of G in the cases of $G = A_6$, S_6, $SL(2,9)$ and etc.