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Jones, John D. S. [Jones, John David Stuart]
The Kervaire invariant of extended power manifolds.
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The author constructs a specific 30-dimensional stably framed manifold with Kervaire invariant one. The existence of such a manifold follows from the translation of the problem into homotopy theory by W. Browder [Ann. of Math. (2) **90** (1969), 157–186; MR0251736] and the homotopy calculations of M. Mahowald and M. C. Tangora [Topology **6** (1967), 349–369; MR0214072]. The manifold is constructed as $M = X \times_G (S^7)^4$, where $G = \sum_2 \mathrm{Wr} \sum_2 \subset \sum_4$ and X is an orientable surface of genus 5 with a free G-action. Let $\xi\colon X \times_G \mathbf{R}^4 \to X/G$. The stable framing of M is induced by the methods of R. J. Milgram [*Unstable homotopy from the stable point of view*, Lecture Notes in Math, Vol. 368, Springer, Berlin, 1974; MR0348740] from the Cayley number framing of S^7 and any stable framing of $\tau(X/G) + 7\xi$. Let $d = 2^{t+1} - 2 - 7 \cdot 2^k > 2$. The author proves that the analogous construction for H an iterated wreath product of Z_2 (k times) and Y a d-manifold with a free H-action can only produce stably framed $(2^{t+1} - 2)$-manifolds $Y \times_H (S^7)^{2^k}$ with Kervaire invariant zero. *Stanley Kochman*