

**Furuta, M.**

**Monopole equation and the  $\frac{11}{8}$ -conjecture.** (English) [Zbl 0984.57011](#)

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If  $M$  is a smooth oriented closed spin 4-dimensional manifold, a well-known open conjecture is that  $M$  satisfies  $b_2(M) \geq \frac{11}{8}|\sigma(M)|$ , where  $b_2(M)$  and  $\sigma(M)$  are the second Betti number and signature of  $M$ , respectively. (This is known as the 11/8 conjecture.) In this paper, the author proves the weaker inequality  $b_2(M) \geq \frac{5}{4}|\sigma(M)| + 2$ . This result, first announced in 1995, is proven using Seiberg-Witten theory. A central idea in the proof is to make use of a finite-dimensional approximation to the usual Seiberg-Witten equations. The author analyzes the  $\text{Pin}_2$  symmetry of these equations, and uses equivariant K-theory to derive the above inequality.

Reviewer: [Terry Fuller \(Northridge\)](#)

**MSC:**

57N13 Topology of the Euclidean 4-space, 4-manifolds (MSC2010)

57R57 Applications of global analysis to structures on manifolds

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