Minisymposium 17 - Globale Analysis

Surgery and harmonic spinors

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(joint work with M. Dahl und E. Humbert)

Let (M, g) be a compact Riemannian manifold (with a fixed spin structure), and let N be obtained from a surgery of codimension ≥ 2. We show that N carries a metric h such that the dimension of the kernel of the Dirac operator on (N, h) is not larger than the dimension of the kernel of the Dirac operator on (M, g). Using surgery results by Gromov-Lawson, Stolz, Bär and others one can conclude that any compact connected spin manifold carries a metric such that the kernel of the Dirac operator is as small as the index obstruction of Atiyah-Singer admits. As our surgery result even holds in codimension 2, the conclusion holds for any fundamental group.