

**Meeting:** 999, Nashville, Tennessee, SS 3A, Special Session on Index Theory and the Topology of Manifolds

999-57-202            **Bruce Williams\*** ([williams.4@nd.edu](mailto:williams.4@nd.edu)), Dept. of Mathematics, 255 Hurley Hall, Notre Dame, IN 46556-4618. *Family Version of Surgery Theory*.

(joint with Michael Weiss) Suppose  $p : E \rightarrow B$  is a fibration with fibers  $n$ -dim. Poincare complexes,  $n > 4$ , and  $B$  a compact CW complex of dimension  $q$ .

Question: When is  $p$  fiber homotopy equivalent to a fiber bundle with fibers closed  $n$ -dim. topological manifolds?

When  $B$  is a point, Ranicki's *total surgery obstruction* theory implies the answer is yes iff the visible symmetric signature of  $E$  can be lifted to the domain of a certain assembly map. If  $B$  is general but we weaken fiber bundle to "block bundle", then Quinn's thesis implies the answer is yes iff the fiberwise visible symmetric signature of  $p$  has a fiberwise lifting to an assembly map.

We define a certain refined fiberwise visible symmetric signature of  $p$  such that if the answer is yes, then our refined invariant has a fiberwise lifting to an assembly map. We also get a converse when  $3q < n - 6$ . (Received August 23, 2004)