POINCARÉ COMPLEX THICKENINGS AND CONCORDANCE OBSTRUCTIONS

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0. **Introduction.** The object of this note is to announce some results on the problem of concordance classification of piecewise linear and smooth homeomorphisms of manifolds. These results are obtained by using the analogous problem for Poincaré complexes to relate the author's results in [2] to the results obtained by use of the techniques of Sullivan as developed in [6].

Briefly the approach is as follows, we describe the author's and Sullivan's results in terms of relative homotopy groups of certain Δ-sets, these fit naturally into the exact sequence of a triple as "two" of the terms, the "third" term can then be interpreted by use of the concept of a Poincaré complex thickening. We begin with a restatement of known results. In general we shall confine our remarks to the piecewise linear category while indicating the modifications which may be required in the smooth case.

1. **Recall of results.**

DEFINITIONS. We recall the definition of the Δ-set [5], $\mathcal{E}(M)$ of homotopy equivalences of M, where M is a PL or smooth manifold with boundary M.

A k-simplex of $\mathcal{E}(M)$ is a homotopy equivalence $f:\Delta^k \times M \to \Delta^k \times M$ such that restriction to a face Δ^s of Δ^k induces a homotopy equivalence of $\Delta^s \times M$, and if D^m_* is a fixed disc containing the base point of M then $f \mid D^m_* \times D = \mathrm{Id}$.

A k-simplex of $\mathcal{D}(M)$ is a PL homeomorphism $f:\Delta^k \times M \to \Delta^k \times M$ such that $f \mid D^m_* \times D = \mathrm{Id}$ and restriction to a face Δ^s of Δ^k induces a PL homeomorphism of $\Delta^s \times M$.

In the differentiable case a slightly more complicated definition is required; the reader is referred to [2] for the details.

We require a third Δ-set, $\mathcal{E}(M, \partial M)$ a k-simplex of which is a homotopy equivalence of pairs

$$f:\Delta^k \times M, \quad \Delta^k \times \partial M \to \Delta^k \times M, \quad \Delta^k \times \partial M$$

such that $f \mid D^m_* \times D = \mathrm{Id}$ and restriction to a face Δ^s of Δ^k induces a

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