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L-homology and the controlled surgery sequence

Abstract. We define the 4-periodic simply-connected surgery spectrum L and discuss Poincaré-Duality in L-homology and assembly/disassembly procedures. Then we compare the controlled surgery sequence with the L-homology long exact sequence of a certain pair of spaces. Special attention is directed to the controlled structure set of an n-manifold M. We outline the use of controlled surgery in 4-dimensional topology and give applications.

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