

**Bak, A.; Muranov, Yu V.**

**Splitting a simple homotopy equivalence along a submanifold with filtration.** (English. Russian original) [Zbl 1166.57019](#)

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A simple homotopy equivalence  $f : M^n \rightarrow X^n$  of manifolds splits along a submanifold  $Y \subset X$  if it is homotopic to a map that is a simple homotopy equivalence on the transversal preimage of the submanifold and on the complement of this preimage. The splitting problem has been extensively studied and is closely related to many problems in geometric topology (see the references of the paper under review).

The problem of splitting a simple homotopy equivalence along a submanifold with filtration is a natural generalization of the problem of splitting along a submanifold. The group  $LSP_{n-2}(X, Y, Z)$  of obstructions to splitting a simple homotopy equivalence  $f : N^n \rightarrow X^n$  along the pair of submanifolds  $(Z \subset Y)$  are defined by *R. Jimenez, Yu. V. Muranov* and *D. Repovš* [*J. K-Theory* 2, No. 2, 385–404 (2008; [Zbl 1166.57020](#))].

In this paper the authors consider a filtration  $\mathcal{X}$ :

$$X_k \subset X_{k-1} \subset \cdots \subset X_1 \subset X_0 = X$$

of closed topological manifold  $X$  by closed locally flat submanifolds and defined the obstruction group  $LSF_*(\mathcal{X})$  to splitting a simple homotopy equivalence along the subfiltration  $\mathcal{Y}$ :

$$X_k \subset X_{k-1} \subset \cdots \subset X_1.$$

Relations between the  $LSF_*$ -groups, the classical surgery obstruction groups, and the Browder-Quinn stratified surgery obstruction groups  $L_*^{BQ}$ , and relations between  $LSF_*$  and various structure sets for the filtration  $\mathcal{X}$  are obtained. The theory is applied to the Browder-Livesay filtration and results of realization of splitting obstructions by simple homotopy equivalence of closed manifolds are obtained.

Reviewer: [Su Yang \(Beijing\)](#)

**MSC:**

[57R67](#) Surgery obstructions, Wall groups  
[19J25](#) Surgery obstructions ( $K$ -theoretic aspects)

Cited in 1 Review  
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splitting obstruction; manifolds with filtration; algebraic surgery theory; Browder-Livesay invariants

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