

Complexity of (non-orientable) Seifert fibre spaces

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Abstract

In this seminary I will deal with Seifert fibre spaces which are compact connected 3-manifolds admitting a foliation by circles. This definition, introduced by P. Scott in 1983, is more general than Seifert's original one. Indeed, these manifolds are locally modeled on both fibered solid tori and fibered solid Klein bottles, and so the singular fibres are either isolated (as in Seifert's definition) or form properly embedded surfaces. I will mainly focus on the non-orientable case since all Seifert fibre spaces containing surfaces of singular fibres are non-orientable. I will introduce a combinatorial description of Seifert fibre spaces and state a classification theorem, up to fibrewise homeomorphisms. Then, after recalling the notions of almost simple spines and complexity introduced by S. Mateveev in (1990), I will describe a spine for these manifolds and use it to obtain an upper bound for their complexity.