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On R -covered foliations of 3-manifolds

A codimension one foliation of a manifold is said to be R -covered if the space of leaves of the pullback of the foliation to the universal cover is homeomorphic to the real line. Sometimes the definition also requires that the foliation of the manifold be transversely oriented, but we will not assume this.

We will present a family of 3-manifolds which possess R -covered foliations, but on the other hand cannot be given a foliation which is both transversely oriented and R -covered. We use a theorem of Calegari and Dunfield that if a 3-manifold has a transversely oriented R -covered foliation, then its fundamental group is left-orderable. Our examples are Haken manifolds which have finite homology groups, possess R -covered foliations, but have non-left-orderable fundamental groups.