

Assembly maps with coefficients in topological algebras and the integral K-theoretic Novikov conjecture

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We prove that any countable discrete and torsion free subgroup of a general linear group over an arbitrary field or a similar subgroup of an almost connected Lie group satisfies the integral algebraic K-theoretic (split) Novikov conjecture over \mathbb{K} and \mathcal{S} , where \mathbb{K} denotes the C^* -algebra of compact operators and \mathcal{S} denotes the algebra of Schatten class operators. Under an additional hypothesis, we prove that such a group also satisfies the algebraic K-theoretic (split) Novikov conjecture over the algebraic closure of the rationals and the complex numbers with finite coefficients. For all Gromov hyperbolic groups, we show that the canonical algebra homomorphism from the group algebra over \mathbb{K} to the reduced group C^* -algebra stabilized by \mathbb{K} induces an isomorphism between their algebraic K-theory groups. We end with a discussion of a recent conjecture of Yu about the algebraic K-theory of the group algebra of a discrete group over \mathcal{S} . At the heart of our strategy lies the Davis-Lueck unified perspective on the isomorphism conjectures. We also make essential use of some deep results due to Skandalis-Tu-Yu and Guentner-Higson-Weinberger on the Baum-Connes conjecture.

Comments: v2 Exposition improved; one lemma and grant acknowledgement added; v3 some terminology changed and details added, Theorems 4.5 and 4.7 in v3 need an extra hypothesis; 25 pages

Subjects: **K-Theory and Homology (math.KT)**; Algebraic Topology (math.AT); Geometric Topology (math.GT); Operator Algebras (math.OA)

MSC classes: 46L80, 46L85, 19D50, 55N20

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