Mathematics > K-Theory and Homology

Joint torsion of several commuting operators

Jens Kaad

(Submitted on 1 Nov 2010 (v1), last revised 28 Nov 2010 (this version, v2))

We introduce the notion of joint torsion for several commuting operators satisfying a Fredholm condition. This new secondary invariant takes values in the group of invertibles of a field. It is constructed by comparing determinants associated with different filtrations of a Koszul complex. Our notion of joint torsion generalizes the Carey-Pincus joint torsion of a pair of commuting Fredholm operators. As an example, under more restrictive invertibility assumptions, we show that the joint torsion recovers the multiplicative Lefschetz numbers. Furthermore, in the case of Toeplitz operators over the polydisc we provide a link between the joint torsion and the Cauchy integral formula. We will also consider the algebraic properties of the joint torsion. They include a cocycle property, a symmetry property, a triviality property and a multiplicativity property. The proof of these results relies on a quite general comparison theorem for vertical and horizontal torsion isomorphisms associated with certain diagrams of chain complexes.

Comments:	42 pages, minor changes, acknowledgements added
Subjects:	**K-Theory and Homology (math.KT)**
MSC classes:	47A13
Cite as:	**arXiv:1011.0356v2 [math.KT]**

Submission history

From: Jens Kaad [view email]
[v1] Mon, 1 Nov 2010 15:49:44 GMT (29kb)
[v2] Sun, 28 Nov 2010 13:45:03 GMT (29kb)

Which authors of this paper are endorsers?