1096-19-1825 **Elizabeth A. Gillaspy*** (`elizabeth.a.gillaspy@dartmouth.edu`), Dartmouth College, Department of Mathematics, 27 N. Main St., Hanover, NH 03755. *The effect of homotopies of groupoid 2-cocycles on C^*-algebraic K-theory.*

Groupoids at once generalize groups, group actions, equivalence relations, and group bundles. In his 1980 thesis, Renault explained how to construct a C^*-algebra $C^*(G,\omega)$ out of a groupoid G and a 2-cocycle $\omega \in Z^2(G,\mathbb{T})$. These twisted groupoid C^*-algebras answer many questions about the structure of other C^*-algebras, and their K-theory gives us information about D-branes in string theory.

When G is a group, Echterhoff et al. proved in 2010 that in many cases, a homotopy $\{\omega_t\}_{t\in[0,1]}$ of 2-cocycles on G leaves the K-theory groups of the twisted group C^*-algebras invariant:

$$K_*(C^*(G,\omega_0)) \cong K_*(C^*(G,\omega_1)).$$

We investigate the extent to which this K-theoretic invariance extends to the world of groupoids.

We have expanded Echterhoff et al.'s result to the case of transformation groups $G \ltimes X$; using different techniques, inspired by a 2012 result of Kumjian et al., we also show that a homotopy of 2-cocycles on the groupoid $\mathcal{G}_\Lambda$ associated to a k-graph Λ induces an isomorphism

$$K_*(C^*(\mathcal{G}_\Lambda,\omega_0)) \cong K_*(C^*(\mathcal{G}_\Lambda,\omega_1)).$$

This result suggests applications to the classification of k-graph C^*-algebras. (Received September 16, 2013)