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**Thomas Goodwillie** and **Kiyoshi Igusa\*** (igusa@brandeis.edu). *Higher Franz-Reidemeister torsion of  $G$ -bundles*. Preliminary report.

If a finite group  $G$  acts fiberwise on a complex vector bundle over a simply connected space, the higher Franz-Reidemeister (FR)-torsion invariants with coefficients in any Mackey functor on the category of finite  $G$ -sets are defined and can be computed. The topological and algebraic contributions can be separated in the formula and in this talk I will concentrate on the algebraic component. Roughly speaking, higher FR-torsion of  $G$ -bundle naturally lives in a module over the Burnside ring  $A_G$  of  $G$  and many of the fundamental properties of FR-torsion can be expressed in terms of this action of  $A_G$ . I will review the definitions of Mackey functors and the Burnside ring and explain how they relate to the topology. The main application is a generalization of “Hatcher’s construction” to  $G$ -bundles. (Received August 28, 2016)