1077-18-1570 **Pinhas Grossman**, **David A Jordan*** (djordan@math.utexas.edu) and **Noah Snyder**. *A fibration controlling G-graded extensions of fusion categories.* Preliminary report.

For a fusion category C, the Brauer-Picard 2-group BrPic(C) of invertible $C - C$-bimodules controls, among other things, the possible extensions of C by a finite group G: these are in bijection with homotopy classes of maps [BG,BBrPic(C)], by a theorem of Etingof, Nikshych and Ostrik. This reduces constructing G-extensions of C to computing obstructions lying in various $H^m(G, \pi_n(BBrPic(C)))$.

We study the functor $M : Eq(C) \to BrPic(C)$, which sends a tensor auto-equivalence F of C to the $C - C$-bimodule category M_F, which is C as a left module category, with right action twisted by F. We compute the homotopy fiber of M to be $Inv(C)$, the groupoid of invertible objects of C. We apply the resulting long exact sequence in homotopy groups to solve several extension problems arising in the theory of subfactors. (Received September 20, 2011)