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Julianna Tymoczko* (tymoczko@math.uiowa.edu), 14 MacLean Hall, Department of Mathematics, University of Iowa, Iowa City, IA 52242. *Permutation group representations and (equivariant) cohomology of Hessenberg varieties.*

The cohomology of the flag variety carries a natural permutation action that we can describe elegantly and explicitly using a combinatorial description of equivariant cohomology called GKM theory. Hessenberg varieties are a natural family of subvarieties of the flag variety which share some important structure with the flag variety, including in some cases an action of the full torus. We will show that the cohomology of the Hessenberg varieties carries one of the permutation actions of the full flag variety. Time permitting, we will also discuss some amazing combinatorial conjectures and properties about these representations. Much of this work is joint with others, including Robert MacPherson (IAS) and Nicholas Teff (U of Iowa). (Received September 22, 2010)