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Robert Thompson* (robt@umn.edu), School of Mathematics, University of Minnesota, 206 Church St SE, Minneapolis, MN 55455. *Cohomology of the Euler-Lagrange complex.*

The theory of the ordinary Euler-Lagrange (E-L) complex provides a powerful tool for studying problems in variational calculus. Because of symmetries naturally present in many variational problems, it is useful to study an invariant version of the E-L complex, blending the theory of the variational bicomplex and the theory of equivariant moving frames.

In this talk we will explain the basic construction of the invariant E-L complex and discuss its cohomology. In particular, we'll explain constructively that its local cohomology is isomorphic to the Lie algebra cohomology of the Lie group acting on the space, and discuss some geometrically interesting cohomology classes.

This is joint work with Francis Valiquette of McGill University. (Received February 16, 2010)