1079-20-245 **Zongzhu Lin** (zlin@math.ksu.edu), Department of Mathematics, Kansas State University, Manhattan, KS 66506, and **Daniel K. Nakano*** (nakano@math.uga.edu), Department of Mathematics, University of Georgia, Athens, GA 30605. *Realizing rings of regular functions via the cohomology of quantum groups.* Preliminary report.

Let G be a complex reductive group and P be a parabolic subgroup of G. In this talk I will address questions involving the realization of the G-module of the global sections of the (twisted) cotangent bundle over the flag variety G/P via the cohomology of the small quantum group. Our main result generalizes the important computation of the cohomology ring for the small quantum group by Ginzburg and Kumar, and provides a generalization of a well-known calculation by Kumar, Lauritzen, and Thompsen to the quantum case and the parabolic setting. As an application we answer the question (first posed by Friedlander and Parshall for Frobenius kernels) about the realization of coordinate rings of Richardson orbit closures for complex semisimple groups via quantum group cohomology. Formulas will be provided which relate the multiplicities of simple G-modules in the global sections with the dimensions of extension groups over the large quantum group.

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