1051-13-265 **Kristen A. Beck*** (kbeck@uta.edu), The University of Texas at Arlington, Department of Mathematics, Box 19408, Arlington, TX 76019, and **David A. Jorgensen**. *On the Existence of Totally Reflexive Modules.* Preliminary report.

Totally reflexive modules form a tool of homological algebra which can be easily defined and understood in terms of totally acyclic complexes. Such modules generalize projective modules in much the same way that projective modules generalize free modules. Moreover, totally reflexive modules are the building blocks of Gorenstein resolutions and are fundamental in the theory and construction of Tate cohomology. The big question concerning these modules regards the necessary conditions for their non-trivial existence. In this talk, after discussing preliminary concepts and definitions, we will focus on investigating local rings over which non-trivial totally reflexive modules exist. In particular, it is well-known that non-regular Gorenstein rings admit such modules, as do rings with embedded deformations. We shall construct a new class of rings which generalizes these known results, and will also consider several illustrative examples. (Received August 26, 2009)