1139-13-469 **Olgur Celikbas*** (olgur.celikbas@math.wvu.edu), West Virginia University, Department of Mathematics, Morgantown, WV 26506, and **Tokuji Araya** (araya@das.ous.ac.jp), Department of Applied Science, Faculty of Science, Okayama University of Science, Okayama, 700-0005, Japan.
Reducing Invariants and total reflexivity. Preliminary report.

Throughout R is a commutative Noetherian local ring and R-modules are assumed to be finitely generated.

Recall a reflexive R-module M is called totally reflexive if $\mathrm{Ext}^i_R(M,R) = 0 = \mathrm{Ext}^i_R(M^*,R)$ for all $i \geq 1$, where $M^* = \mathrm{Hom}_R(M,R)$. The totally reflexive modules are precisely the nonzero modules of Gorenstein dimension zero. In 2006 Jorgensen and Şega proved the conditions defining total reflexivity are independent: they constructed a ring R, and a reflexive R-module M such that $\mathrm{Ext}^i_R(M,R) = 0 \neq \mathrm{Ext}^i_R(M^*,R)$ for all $i \geq 1$.

I will report on an ongoing joint work with Tokuji Araya. In view of the aforementioned result, we consider the problem of determining new conditions, under which the vanishing of $\mathrm{Ext}^i_R(M,R)$ forces M to be totally reflexive. Motivated by the definition of reducible complexity, a notion studied by Bergh, we introduce the reducing versions of standard homological dimensions.

In this talk we will raise some questions and discuss one of our results in this direction: if a module M has finite reducing Gorenstein dimension and $\mathrm{Ext}^i_R(M,R) = 0$ for all $i \geq 1$, then M is totally reflexive. (Received February 19, 2018)