HIGHER DIFFERENTIALS OF LOW ORDER OVER GRADED COMMUTATIVE RINGS

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Abstract. The goal of this project is to describe modules of higher differentials for graded algebras over a field in certain cases. We have developed several methods of describing a computable free resolution of its dual, the module of principal parts.

This project is ongoing work beginning March 2019. We would like to describe the free resolution of the module of principal parts $P^n_{R/k}$ over a standard graded commutative ring R. We currently have preliminary results in the case of a graded hypersurface in three variables for the 2nd order differentials and some computations on Macaulay2 (an algebra computing system) toward the 3rd order differentials. We are in the processing of typing a preliminary draft of the results. This is joint work with Rachel Diethorn (Yale University), Jack Jeffries (University of Nebraska-Lincoln), Claudia Miller (Syracuse University), Josh Pollitz (University of Utah), Hamid Rahmati (University of Nebraska-Lincoln) and Sophia Vassiliadou (Georgetown University). We hope to have publishable results in the next year.