1124-14-201 **Hoon Hong**, **Zachary Hough*** (zchough@ncsu.edu) and **Irina Kogan**. *Algorithm for computing μ-bases of univariate polynomials.*

We present a new algorithm for computing a μ-basis of the syzygy module of n polynomials in one variable over an arbitrary field $\mathbb{K}$. The algorithm is conceptually different from the previously-developed algorithms by Cox, Sederberg, Chen, Zheng, and Wang for $n = 3$, and by Song and Goldman for an arbitrary n. The algorithm involves computing a "partial" reduced row-echelon form of a $(2d + 1) \times n(d + 1)$ matrix over $\mathbb{K}$, where d is the maximum degree of the input polynomials. The proof of the algorithm is based on standard linear algebra and is completely self-contained. The proof includes a proof of the existence of the μ-basis and as a consequence provides an alternative proof of the freeness of the syzygy module. The theoretical (worst case asymptotic) computational complexity of the algorithm is $O(d^2n + d^3 + n^2)$. We have implemented this algorithm (HHK) and the one developed by Song and Goldman (SG). Experiments on random inputs indicate that SG is faster than HHK when d is sufficiently large for a fixed n, and that HHK is faster than SG when n is sufficiently large for a fixed d. (Received September 08, 2016)