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John Myers*, 7060 State Route 104, Oswego, NY 13126. *Koszul-Tate resolutions as twisted tensor products*. Preliminary report.

Let R be a standard graded commutative algebra over a field k and let K be the Koszul complex on a minimal set of generators of the augmentation ideal of R . Then $\mathrm{Tor}^R(k, k)$ is well-known to be a Hopf algebra (e.g., as the homology of the bar construction), but such a structure can also be realized through a Koszul-Tate resolution of k over R and a coproduct originally defined by Assmus. Furthermore, by factoring out a certain coideal (with respect to the Assmus coproduct) one passes from $\mathrm{Tor}^R(k, k)$ to $\mathrm{Tor}^K(k, k)$, the latter Tor being a “derived” version computed via semifree resolutions.

In this talk, for certain classes of algebras we will show how the Assmus coproducts on $\mathrm{Tor}^R(k, k)$ and $\mathrm{Tor}^K(k, k)$ conspire with R and K to factor the Koszul-Tate resolution as twisted tensor products $R \otimes_{\tau} \mathrm{Tor}^R(k, k)$ and $K \otimes_{\tau'} \mathrm{Tor}^K(k, k)$, where τ and τ' are certain acyclic twisting cochains. Applications will be included. (Received March 02, 2020)