1164-13-130 **Maiko Ono*** (ono@pub.ous.ac.jp), Okayama University of Science, Japan, and **Saeed Nasseh** and **Yuji Yoshino**. *The theory of j-operators for DG modules.*

Let A be a DG algebra over a commutative ring. Here $A\langle X\rangle$ denotes an extended DG algebra of A with a single variable X. John Tate introduced the notion of j-operators for $A\langle X\rangle$. We extend it to the case of a certain ring of differentials that is an extension of the endomorphism ring of a semi-free DG $A\langle X\rangle$-module. In my talk, I will explain the precise definition of j-operators and their properties. As an application, we construct an obstruction class of (weak) lifting of DG modules in both case where the degree of X is even and odd. More precisely, for a bounded below semi-free DG $A\langle X\rangle$-module (N, ∂) there is an element $[j_X(\partial)]$ in $\mathrm{Ext}^{|X|+1}_{A\langle X\rangle}(N, N)$, and $[j_X(\partial)] = 0$ if and only if N is weakly liftable to A.

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