Quantum cluster algebras and representations of shifted quantum affine algebras

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Shifted quantum affine algebras were introduced by Finkelberg and Tsymbaliuk. They are quantum groups parameterized by a coweight of the underlying Lie algebra. Hernandez defined a category O of representations of these algebras and Geiss-Hernandez-Leclerc proved that the Grothendieck ring of this category O has a cluster algebra structure. I have provided a quantization for this cluster algebra, with the intention of defining a quantum Grothendieck ring for the category O (in the spirit of Nakajima and Varagnolo-Vasserot). I will explain how the quantization is obtained and some applications, such as quantum QQ-systems and a quantum cluster algebra structure on the q-oscillator algebra.