

QUIVER VARIETIES AND QUANTUM CLUSTER ALGEBRAS

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ABSTRACT. Inspired by Nakajima's previous work [Nak11] on bipartite (quantum) cluster algebras, we construct all acyclic quantum cluster algebras via perverse sheaves over graded quiver varieties. The construction follows the spirit of the conjectural monoidal categorification proposed by Hernandez and Leclerc [HL10]. As a consequence, we obtain that all the quantum cluster variables have positive cluster expansions, whenever there exists an acyclic seed.

This is joint work with Yoshiyuki Kimura.

REFERENCES

- [HL10] David Hernandez and Bernard Leclerc, *Cluster algebras and quantum affine algebras*, Duke Math. J. **154** (2010), no. 2, 265–341, [arXiv:0903.1452](#).
- [Nak11] Hiraku Nakajima, *Quiver varieties and cluster algebras*, Kyoto J. Math. **51** (2011), no. 1, 71–126, [arXiv:0905.0002v5](#).

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