On the bounded derived category of the Tamari lattices

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The Tamari lattices are nice finite classical partial orders with Catalan elements. From the point of view of representation theory, they appear as posets of tilting modules and as posets of cluster tilting modules for an equioriented quiver of type A.

Chapoton was one of the first to realize that the representation theory of their incidence algebra is also fascinating. He conjectured, among other things, that the bounded derived categories of the Tamari lattices are fractionally Calabi-Yau.

In this talk, I will present my progress towards the proof of this conjecture. I will describe an interesting family of indecomposable objects in bijection with the noncrossing trees. Then, I will give a combinatorial description of the action of the Serre functor on the objects of this family.

References

[1] F. Chapoton, *On the categories of modules over the Tamari posets*, In Associahedra, Tamari lattices and related structures, volume 299 of Prog. Math. Phys., pages 269–280. Birkhäuser/Springer, Basel, 2012.

[2] Baptiste Rognerud. Exceptional and modern intervals of the tamari lattice, 2018. arXiv:1801.04097.