Torsion lattice of GLS path algebra and Cambrian lattice

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In representation theory of algebra, a torsion class refers to a subcategory of the category of finitely generated modules that is closed under extensions and quotients. The collection of all such subcategories forms a partially ordered set, called the torsion lattice. On the other hand, a Cambrian lattice is also a lattice that arises from a particular set of elements in the Weyl group associated with a root system. Both of these lattice structures are highly versatile and appear in various fields in different forms. In 2006, Ingalls and Thomas showed that the torsion lattice arising from the path algebra associated with ADE-type Dynkin quiver and the Cambrian lattice arising from the same Dynkin quiver coincide, and since then, there have been many studies on the relationship between these two lattices. In this talk, we explain the extension of the isomorphism between the lattices discovered by Ingalls and Thomas to Dynkin graphs that are not simply-laced. Specifically, we discuss the isomorphism between the GLS path algebra, defined by Geiß–Leclerc–Schröer, and the Cambrian lattice.

References

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