

Finite dimensional irreducible representations of the TD-algebra

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In this talk, I will determine finite-dimensional irreducible representations of the tridiagonal algebra (TD-algebra).

The TD-algebra has three types: the type I includes the positive part of the quantum affine algebra $U_q(\widehat{\mathfrak{sl}}_2)$ and the q-Onsager algebra; the type II includes the Onsager algebra and its generalization; type III is related to the quantum affine algebra $U_q(\widehat{\mathfrak{sl}}_2)$ at $q = -1$. Drinfel'd polynomials play the key role in the determination of such irreducible representations.

As an application, we classify tridiagonal pairs by explicitly constructing them as certain sort of tensor products of Leonard pairs, which will in turn provide a key tool for the classification of (P and Q)-polynomial association schemes through the investigation of their Terwilliger algebras.