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The higher rank Racah algebra

A higher rank generalization of the (rank one) Racah algebra is obtained by considering the tensorproduct of n copies of $\mathfrak{su}(1,1)$. It also arises as symmetry algebra of the $\mathbb{Z}_2^n$ Dunkl-Laplacian. This leads to a superintegrable system on the n-sphere. We highlight a number of interesting properties of this algebra and focus on the role of the labelling Abelian subalgebras. Connection coefficients between bases diagonalized by these Abelian algebras are multivariate Racah polynomials as defined by M. V. Tratnik. The link with the discrete model of the Racah algebra will be explained.

This is joint work with Hendrik De Bie, Vincent X. Genest and Luc Vinet.