

Multivariable hypergeometric polynomials related to the bispectral problem and superintegrability

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Abstract

The bispectral problem concerns the construction and the classification of operators possessing a symmetry between the space and spectral variables. Different versions of this problem can be solved using techniques from integrable systems, algebraic geometry, representation theory, classical orthogonal polynomials, etc. I will review the problem and some of these connections and then discuss new results related to multivariable hypergeometric polynomials and the generic quantum superintegrable system on the sphere.