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**Integral operators, bispectrality and growth of Fourier algebras.** (English)  

Summary: In the mid 1980s it was conjectured that every bispectral meromorphic function $\psi(x, y)$ gives rise to an integral operator $K_\psi(x, y)$ which possesses a commuting differential operator. This has been verified by a direct computation for several families of functions $\psi(x, y)$ where the commuting differential operator is of order $\leq 6$. We prove a general version of this conjecture for all self-adjoint bispectral functions of rank 1 and all self-adjoint bispectral Darboux transformations of the rank 2 Bessel and Airy functions. The method is based on a theorem giving an exact estimate of the second- and first-order terms of the growth of the Fourier algebra of each such bispectral function. From it we obtain a sharp upper bound on the order of the commuting differential operator for the integral kernel $K_\psi(x, y)$ leading to a fast algorithmic procedure for constructing the differential operator; unlike the previous examples its order is arbitrarily high. We prove that the above classes of bispectral functions are parametrized by infinite-dimensional Grassmannians which are the Lagrangian loci of the Wilson adelic Grassmannian and its analogs in rank 2.

**MSC:**

47G10 Integral operators

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**References:**

References


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