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Eigenvalue problem of the inhomogeneous pluriharmonic system for the third boundary condition on the unit polydisc

The explicit eigenvalues and eigenfunctions of the inhomogeneous pluriharmonic functions for the third boundary condition on the unit polydisc are studied. Particular solution, compatibility and solvability conditions are also considered. It is shown that for each eigenvalue k of the problem, there are multiple number of eigenfunctions (k order homogeneous polynomials) and for the number of solutions an interesting recurrence relation is provided.