
SEMINAR

on

COMPLEX AND HYPERCOMPLEX ANALYSIS

Sala Sousa Pinto, Departamento de Matemática

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Harmonic, monogenic, and contragenic functions in spheroidal domains

João Morais

Mexico Autonomous Institute of Technology

We investigate the construction of orthogonal bases for the spaces of harmonic, monogenic, ambigenic, and contragenic functions defined in spheroidal domains of arbitrary eccentricity, whose elements are parametrized by the shape of the corresponding spheroids. A detailed study regarding the elements that constitute these bases is carried out. The notion of a contragenic function depends on the domain; therefore, it is not a local property in contrast to the concepts of harmonic and monogenic functions. Various conversion formulas that relate systems of harmonic, monogenic, and contragenic functions associated with spheroids of differing eccentricity are presented. Furthermore, the existence of standard nontrivial contragenic functions is shown for spheroids of any eccentricity.

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