Operator Triplets In Applied Mathematics

Mathematik

Alexander A. Dorfmann

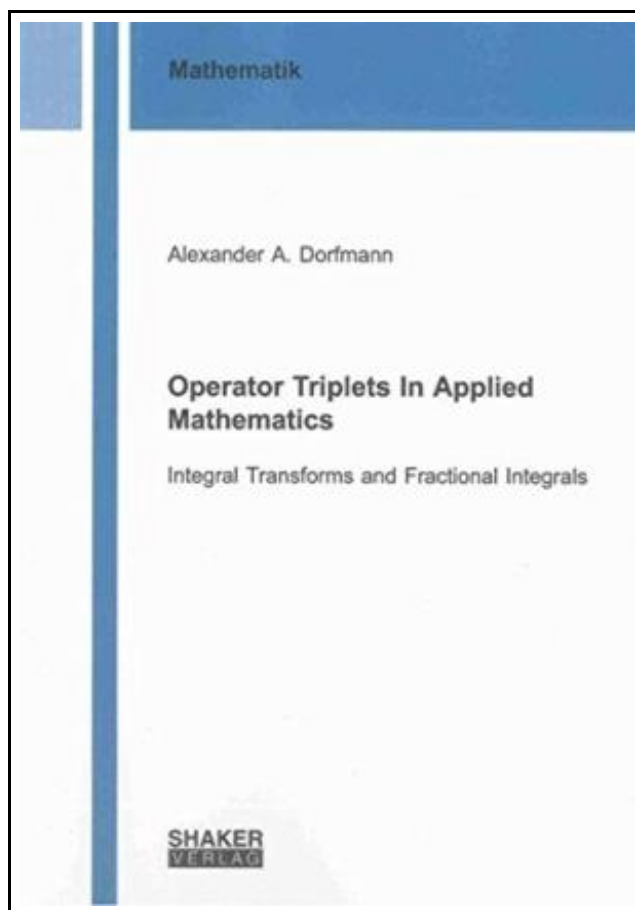**Operator Triplets In Applied Mathematics**

Integral Transforms and Fractional Integrals

SHAKER VERLAG

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Reviews

This ebook is very gripping and fascinating. Sure, it is engage in, nevertheless an amazing and interesting literature. It is extremely difficult to leave it before concluding, once you begin to read the book.
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OPERATOR TRIPLETS IN APPLIED MATHEMATICS

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Shaker Verlag Mai 2013, 2013. Buch. Book Condition: Neu. 21x14.8x cm. Neuware - Theory of integral transforms is an important part of applied mathematics and signal processing. An integral transform can be defined by a pair of orthogonal integral operators, whose kernels can be represented in terms of functions of two variables. Usually kernels of these operators are expressed by means of regular functions and based on complete orthogonal systems. The integral transforms yield a power tool for investigation of differential, difference and integral equations. Fractional integrals also consist of pair of orthogonal operators, however their kernels involve weak-singular generalised functions of power type. Abel integral equations form foundation of theory of the fractional integrals. There is an interesting feature of integral operators: various integral operators can be combined among themselves by means of operator product. These combinations of integral transforms open new ways and opportunities for solving of problems of applied mathematics. For example, the fractional integrals can connect two integral transforms with different regular kernels. Mathematically this relation can be expressed by means of discontinuous integrals. Thus the well-known discontinuous Weber integrals can be treated as a relation of Fourier transform and Hankel transform by means of Abel fractional integrals. In this work we introduce under consideration a new mathematical structure: operator triplet (triplet of orthogonal integral operators or triplet of integral transforms). We define operator triplet as a combination of three pair of orthogonal integral operators. Generally an operator triplet is a closed system of mathematical structures, which consists of three orthogonality relations of integral transforms and system of integral representations for kernels of orthogonal systems. An important group of triplets form combinations of two integral transforms with regular kernels and pair of fractional integrals (triplet of integral transforms). This triplet contains two orthogonality relations of integral...

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