

Operator factorization, matrix identities and normalization

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Abstract

This is a short survey on some aspects of operator relations given by factorization or operator matrix identities. First we expose the basic concepts and discuss properties of - and equivalence between - various operator relations. Secondly we present applications to linear boundary value problems (for the Helmholtz equation in conical domains) and to classes of singular equations (of Toeplitz or Wiener-Hopf plus Hankel type) which lead to concrete results such as Fredholm criteria for classes of singular operators, the analytical solution of boundary value problems and normalization of ill-posed problems.