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Equations such as $AX + YB = Z$ in Matrices and Operators

Let A and B be square matrices of the same size. It is easily seen that the mapping that sends each pair (X, Y) of square matrices into the matrix $AX + YB$ is onto if and only if at least one of A and B is invertible. The analogue is established for operators on Hilbert space, and partial results are obtained for more general operator equations in several variables.

This is joint work with Don Hadwin and Eric Nordgren.