

Mutual position of two subspaces and two operators

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The first part of this talk will be mainly expository, orbiting around the problem of closedness of the linear sum of two closed subspaces in a Hilbert space. We will present some well-known results regarding this problem, give a few examples from different contexts and some interpretations. The second part of the talk will be devoted to the following problem: when do two bounded operators, defined on different subspaces of the same Hilbert space, have an equal continuous (or closed) extension to the whole space? In solving such a problem we will recall some old results of Ando on Lebesgue-type decomposition of operators, and Izumino on Quotient operators, but we will also invoke new results regarding unbounded pseudoinverses and orthoprojections. An application of these results will be given in the end of the talk.