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Strong Factorizations between Couples of Operators on Banach Function Spaces

Let $T\colon X_1 \to Y_1$ and $S\colon X_2 \to Y_2$ be two continuous linear operators between Banach function spaces related to a finite measure space. Under some lattice requirements on the spaces involved, we give characterizations by means of inequalities of when T can be strongly factorized through S, that is, $T = M_g \circ S \circ M_f$ with $M_f\colon X_1 \to X_2$ and $M_g\colon Y_2 \to Y_1$ being multiplication operators defined by some measurable functions f and g. In particular, we study the cases when S is a composition operator or a kernel operator.

Keywords: Banach function spaces, factorization of operators, multiplication operators, product spaces, vector measures.

MSC: 46E30, 47B38; 46B42