Domination by positive operators

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We will study the domination problem for several classes of positive operators between Banach function spaces. Precisely the domination problem consists in given two positive operators $0 \leq R \leq T$ between two Banach lattices E and F, assuming that T belongs to a certain operator class; must R belong to the same class? The goal is to obtain positive answers by imposing mild conditions on the Banach lattices E and F. Important results for the compact operator class were obtained by *Pitt* for $L^p(\mu)$-spaces, *Dodds* and *Fremlin* for order continuous Banach lattices and by *Aliprantis* and *Burkinshaw*, which are useful in other areas. We will survey recent results on the behavior of related operator classes like strictly singular (or *Kato*) operators, strictly co-singular (or *Pelczynski*) operators as well as their local versions. Applications to classical rearrangement invariant function spaces will be given.