A Lebesgue Decomposition for Nonnegative Forms

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A nonnegative form $\mathfrak{t}$ on a complex linear space is decomposed with respect to another nonnegative form $\mathfrak{w}$ into an almost dominated part and a singular part. The almost dominated part is the largest form majorized by $\mathfrak{t}$ which is closable. This decomposition addresses a problem posed by Simon. The Lebesgue decomposition of a pair of finite measures corresponds to the present decomposition of the forms which are induced by the measures. Ando's decomposition of a nonnegative bounded linear operator in a Hilbert space with respect to another nonnegative bounded linear operator is a consequence. An important ingredient in the present paper is the parallel sum of forms.