MINIMIZATION OF CONSTRAINED QUADRATIC FORMS IN HILBERT SPACES

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ABSTRACT. A common optimization problem is the minimization of a symmetric positive definite quadratic form $\langle x, Tx \rangle$ under linear constraints. The solution to this problem may be given using the Moore–Penrose inverse matrix. In this work at first we extend this result to infinite dimensional complex Hilbert spaces, where a generalization is given for positive operators not necessarily invertible, considering as constraint a singular operator. A new approach is proposed when T is positive semidefinite, where the minimization is considered for all vectors belonging to $\mathcal{N}(T)^{\perp}$.

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