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Bounded Nonconvex Chebyshev Sets in a Real Inner Product Space

A subset S, of a real finite dimensional inner product space X, has the property that each point in X has a unique nearest point in S iff S is closed and convex. Such a set is called a unique nearest point set. If X is a Hilbert space, must a unique nearest point set in X be convex? The real inner product space Y of all infinite number sequences having at most a finite number of nonzero terms, with the usual inner product, contains a non convex unique nearest point set S, moreover S can be made bounded. Now, if H denotes the completion of Y, and T the closure of a bounded unique nearest point set S in Y, then if each of $\{P_i\}$ and $\{Q_i\}$ is a sequence in Y, converging to points P and Q respectively in H, where for each i, Q_i is the unique nearest point in S to P_i, then Q is the unique nearest point to P in T. Moreover, there is a sequence $\{V_i\}$ in Y converging to a point V in H and a non convergent sequence $\{W_i\}$, where W_i is the unique nearest point to V_i in S.