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Shift invariant subspaces and metric projections in H^p

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In a normed linear space, it is often natural to study the distance between a given point and a subspace. In particular, can one determine the distance between the point and the subspace, and can one find a point in the subspace which is nearest to the given point? A nearest point may fail to be unique or exist at all. However, in Hilbert space, an orthogonal projection provides the solution to this problem. In suitable Banach spaces, metric projections, which are non-linear analogues of orthogonal projections, produce the minimizer. We will consider such projections on the classical Hardy spaces on the unit disk. In particular, after motivation coming from Beurling's Theorem, we will discuss projections of the unit constant function onto shift-invariant subspaces. Joint work with C. Bénéteau, R. Cheng, D. Khavinson, M. Manolaki, and K. Maronikolakis.