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Timothy J. Ferguson* (tjferguson1@ua.edu). *Bergman and Szegő projections, Extremal Problems, and Square Functions.*

We study estimates for Hardy space norms of analytic projections. We first find a sufficient condition for the Bergman projection of a function in the unit disc to belong to the Hardy space H^p for $1 < p < \infty$. We apply the result to prove a converse to an extension of Ryabykh's theorem about Hardy space regularity for Bergman space extremal functions. We also prove that the H^q norm of the Szegő projection of $F^{p/2}\overline{F}^{(p/2)-1}$ cannot be too small if F is analytic, for certain values of p and q . We apply this to show that the best analytic approximation in L^p of a function in both L^p and L^q will also lie in L^q , for certain values of p and q . (Received September 13, 2020)