1040-41-64 **Konstantin Osipenko*** (kosipenko@yahoo.com), Dept. of Math., MATI, Orshanskaya 3, Moscow, 121552, Russia, and **Michael Stessin** (stessin@math.albany.edu), Dept. of Math., 1400 Washington Ave., Albany, NY 12222. *Hadamard and Schwarz type extremal problems and optimal recovery of functions.*

Let $D \subset \mathbb{C}^k$ be a domain, ν be a probability measure on $\bar{D}$ and X be a closed subspace of $L^2(\nu)$. Consider $D_0, \ldots, D_n \subset D$ and probability measures $\mu_0, \ldots, \mu_n$ on $D_0, \ldots, D_n$ respectively. We suppose that $X \subset L^2(\mu_j)$, $j = 0, 1, \ldots, n$. We consider the following extremal problem

$$\sup \left\{ \|f_0\|^2_{L^2(\mu_0)} : f \in X,\ \|f_j\|^2_{L^2(\mu_j)} \leq \delta_j^2,\ j = 1, \ldots, n \right\}, \tag{1}$$

where f_j is the restriction of f to D_j and $\delta_j \geq 0$, $j = 1, \ldots, n$. We show that this problem is closely related to the problem of optimal recover of f_0 knowing f_j with some errors (δ_j are levels of accuracy).

We prove a general theorem which gives a necessary condition of extremum in this problem in terms of inclusion in certain annihilators. Using this theorem we obtain the solution of (1) for extremal problems similar to the well-known Hadamard three circle theorem and Shwartz Lemma. (Received January 22, 2008)