Mark A Spanier*, mark.spanier@ndsu.edu. Extremal Signatures and Best $L^1(\mu)$-Approximations. Preliminary report.

For a given Borel measure $\mu$ on $\mathbb{R}$, let $A_1(\delta, \mu)$ be the space of entire functions of exponential type at most $\delta$ in $L^1(\mathbb{R}, \mu)$. A function $\psi : \mathbb{R} \to \mathbb{C}$ such that $|\psi(x)| = 1$ a.e. is called an extremal signature for $\mu$, if

$$\int_{-\infty}^{\infty} \psi(x) F(x) \, d\mu(x) = 0$$

for all $F \in A_1(\delta, \mu)$. Such functions are extremely important in the study of best approximations of prescribed exponential type (bandlimited functions) in $L^1(\mu)$-norm.

For a class of measures of the form $d\mu_E(x) = |E(x)|^{-2} \, dx$ where $E$ is a Hermite-Biehler function, we determine extremal signatures for $\mu_E$. Using these signatures and general interpolation results, we are able to construct best $L^1(\mu_E)$-approximations to large families of functions. This presentation is based on joint work with Friedrich Littmann. (Received September 11, 2014)