Meeting: 1003, Atlanta, Georgia, AMS CP 1, AMS Contributed Paper Session

1003-33-1065 **Friedrich Littmann*** (flittman@math.ubc.ca), Department of Mathematics, University of British Columbia, 1984 Mathematics Road, Vancouver, BC V6T 1Z2, Canada. *Quantitative Tauberian theorems and an extremal problem in Fourier analysis.* Preliminary report.

A Tauberian theorem deduces statements about the average on $[0,x]$ of a positive Borel measure α from the behavior of $L(s)-(s-1)^{-1}$ in the halfplane $\Re s \geq 1$, where $L(s)=\int_{0-}^{\infty}\exp(-ts)d\alpha(t)$.

Let $f_r(x)=\exp(-rx)$ for $x>0$ and $f(x)=0$ for $x<0$. In 1981, S. W. Graham and J. D. Vaaler found best one-sided approximations to $f_r(x)$ by entire functions of finite exponential type and used these as tools to give sharp bounds in a Tauberian theorem for α under the assumption that the continuation of $L(s)-(s-1)^{-1}$ from $\Re s>1$ to $\Re s=1$ is known only for $|\Im s|<T$ with some positive constant T.

In this talk I will address the problem of best one-sided approximation of $x^n f_r(x)$ and its connection with Tauberian theorems for integrated measures. For $n>0$ the construction of the auxiliary approximations requires knowledge of the zeros of the generating function of the Bernoulli polynomials, $g(t,a)=t\exp(at)(\exp(t)-1)^{-1}$ in the region $\mathbf{R}\times[0,1]$. If time permits, I will sketch the connection. (Received October 03, 2004)