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Emanuel Carneiro, Friedrich Littmann and Jeffrey D. Vaaler* (vaaler@math.utexas.edu),
1 University Station, C1200, Austin, TX 78712. *Some Extremal Functions in Fourier Analysis.*

We will describe some recently discovered solutions to the Beurling-Selberg extremal problem for certain special functions. If $f(x)$ is a suitable real valued function of the real variable x , the problem we consider is to identify a real, entire function $F(z) = F(x+iy)$ such that $f(x) \leq F(x)$ for all real x , $F(z)$ has exponential type at most 2π , and the integral of $F(x) - f(x)$ along the real axis is minimized. Analogous problems for periodic functions $f(x)$ will also be considered. For certain special choices of $f(x)$, for example $f(x) = |x|^\beta$ with $\beta > 0$, or $f(x) = \exp\{-\pi x^2\}$, the solution to this extremal problem has applications in analytic number theory. (Received August 19, 2009)