

Complex Tauberian theorems for Laplace transforms

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Tauberian theorems have proven to be useful in diverse areas of mathematics such as number theory and spectral theory of differential operators. The Tauberian theorems that we will discuss will be of the following type. Under some regularity assumptions on τ the asymptotic relation $\tau(x) = o(1)$ can be deduced from certain boundary behavior of the Laplace transform $\mathcal{L}\{\tau; s\}$ on the line $\Re s = 0$. The regularity assumptions are usually called Tauberian conditions and are typically boundedness or monotonicity conditions. For many Tauberian conditions, local pseudofunction behavior of $\mathcal{L}\{\tau; s\}$ on the line $\Re s = 0$ has been shown to be necessary and sufficient to deduce $\tau(x) = o(1)$. We will present some of the latest developments in this field. The talk is based on collaborative work with Jasson Vindas.