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8. Analysis

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Topologies on Some F-algebras of Holomorphic Functions
For $p > 1$, the class N^p consists of all holomorphic functions f on the open unit disk in $\mathcal{C}$ for which

$$\sup_{0 \le r < 1} \int_0^{2\pi} \left(\log^+ |f(re^{i\theta})|\right)^p \frac{d\theta}{2\pi} < \infty.$$

By analogy with different topologies considered by J. E. McCarthy on the Smirnov class, we introduce and compare corresponding topologies on the space N^p. Further, we consider the individual spaces $H^2(\omega)$, where ω is a positive measurable function on the unit circle T such that ω and $|\log \omega|^p$ are summable. We give asymptotic versions of Szegö's and the Helson-Szegö theorem on these spaces, and characterize the universal multipliers of their duals.