# FINE ASYMPTOTICS FOR BERGMAN ORTHOGONAL POLYNOMIALS OVER DOMAINS WITH CORNERS

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ABSTRACT

Let $G$ be a bounded simply-connected domain in the complex plane $\mathbb{C}$, whose boundary $\Gamma := \partial G$ is a Jordan curve, and let $\{p_n\}_{n=0}^{\infty}$ denote the sequence of Bergman polynomials of $G$. This is defined as the sequence

$$p_n(z) = \lambda_n z^n + \cdots, \quad \lambda_n > 0, \quad n = 0, 1, 2, \ldots,$$

of polynomials that are orthonormal with respect to the inner product

$$\langle f, g \rangle := \int_G f(z)\overline{g(z)} dm(z),$$

where $dm$ stands for the area measure.

The purpose of the talk is to report on recent results regarding the fine asymptotic behaviour of the polynomials $p_n(z)$, in $\Omega := \mathbb{C} \setminus (\overline{G})$, and the leading coefficients $\lambda_n$, $n \in \mathbb{N}$, in cases when the boundary $\Gamma$ is piecewise analytic without cusps. These results complement an investigation started in the 1920's by T. Carleman, who obtained the fine asymptotics for domains with analytic boundaries and carried over by P.K. Suetin in the 1960's, who established them for domains with smooth boundaries.