Ernst Albrecht (ernstalb@math.uni-sb.de) FR 6.1 Mathematik, University of Saarlandes, 66041 Saarbrücken, Germany, ***Regularity results for Banach function algebras of the Dales-Davie-type.***

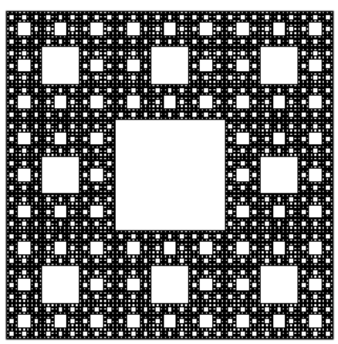
ABSTRACT. Let K be a perfect, compact set in the complex plane and let $(M_p)_{p=0}^{\infty}$ be a sequence of positive numbers such that

$$M_0 = 1 \quad \text{and} \quad M_q M_{p-q} \binom{p}{q} \leq M_p \quad (q = 0, \ldots, p, p \in \mathbb{N}_0)$$

Following H.G. Dales and A.M. Davie, we consider the algebra $D(K; \{M_p\})$ of all infinitely complex differentiable functions f on K satisfying

$$\|f\|_{\{M_p\}} := \sum_{p=0}^{\infty} \frac{1}{M_p} \sup_{z \in K} |f^{(p)}(z)| < \infty \, .$$

In general these algebras are not complete with respect to the given norm. Therefore we consider their completions (denoted by $\tilde{D}(K; \{M_p\})$). Sufficient conditions (on K) to ensure that this completion is still a subalgebra of $C(K)$ have been given by W.J. Bland, J.F. Feinstein, and H.G. Dales. In this talk we give sufficient conditions for $\tilde{D}(K; \{M_p\})$ to be regular as a Banach algebra and admits partitions of unity.



As an example consider the case that K is the Sierpiński gasket. Then $\tilde{D}(K; \{M_p\})$ is regular for the Gevrey sequences $(p!^s)_p, (p^{ps})_p$ $s > 1$, and for the sequence $(M_p^{(\alpha)})_p$ with

$$M_p^{(\alpha)} := p! \log(e + p)^{p/\alpha}, \quad \left(0 < \alpha < 2 - \frac{\log 8}{\log 3}\right).$$

The results are based on a joint work with T. Athar.