QUALITATIVE PROPERTIES OF THE PERIPHERAL SPECTRUM

JAROSLAV ZEMÁNEK

Institute of Mathematics, Polish Academy of Sciences
P.O. Box 21, 00-956 Warszawa, Poland
E-mail: zemanek@impan.gov.pl

Let $A(z)$ be an analytic operator-valued function, say, on the open unit disc $\mathbb{D}$. Suppose that the spectral radius of $A(z)$ is a constant $c \geq 0$ independent of $z \in \mathbb{D}$. Then also the *peripheral spectrum*

$$S = \{\lambda \in \operatorname{Sp} A(z) : |\lambda| = c\}$$

is independent of $z \in \mathbb{D}$, see [1, Proposition 2].

Suppose that a point $\lambda \in S$ has some qualitative property with respect to the spectrum $\operatorname{Sp} A(z_0)$ for some $z_0 \in \mathbb{D}$, e.g., it is an isolated point, like an essential singularity or a pole of the resolvent of the operator $A(z_0)$. Does it possess the same property for all $A(z), z \in \mathbb{D}$?

References

[1]   E. Vesentini, *Maximum theorems for spectra*, in: Essays on Topology and Related Topics (Mémoires dédiés à Georges de Rham), Springer, Berlin, 1970, 111–117.