

Vector-Valued Logarithmic Residues and Non-Commutative Gelfand Theory

H. Bart

joint work with T. Ehrhardt and B. Silbermann

A vector-valued logarithmic residue is a contour integral of the type

$$\frac{1}{2\pi i} \int_{\partial D} f'(\lambda) f(\lambda)^{-1} d\lambda \quad (1)$$

where D is a bounded Cauchy domain in the complex plane and f is an analytic Banach algebra valued function taking invertible values on the boundary ∂D of D . One of the main issues concerning such logarithmic residues is the following: if (1) vanishes, under what circumstances does it follow that f takes invertible values on all of D ? A closely related question is: under what conditions does a Banach algebra have trivial zero sums of idempotents only? Recent developments to be discussed in the talk involve new aspects of non-commutative Gelfand theory.