Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

MUΦX Lehrstuhl

Im Oberseminar

Deformationsquantisierung

spricht am **27.05.2016 um 14 Uhr c.t.,**

im Seminarraum 00.009 (Physik Ost)

MATTHIAS SCHÖTZ

über das Thema:

An unusual power series expansion for certain holomorphic functions

Let $\overline{\mathbb{C}} := \mathbb{C} \cup \{\infty\}$ be the Riemann-sphere,

$$\Omega := \big(\overline{\mathbb{C}} \times \overline{\mathbb{C}}\big) \setminus \Big(\big\{ (x,y) \in \mathbb{C} \times \mathbb{C} \;\big|\; xy = 1 \big\} \cup \big\{ (0,\infty), (\infty, 0) \big\} \Big)$$

and denote by $\mathcal{O}(\Omega)$ the Fréchet space of all holomorphic functions on Ω with the usual topology of uniform convergence on all compact subsets of Ω. I will prove (or sketch the prove) that all $\hat{f} \in \mathcal{O}(\Omega)$ can be represented by a locally-uniformly and absolutely converging power-series

$$\hat{f}(x,y) = \sum_{p,q=0}^{\infty} f_{p,q}\, \hat{e}_{p,q}(x,y) \qquad \text{for all } (x,y) \in \Omega \qquad (*)$$

$$\text{with} \quad \hat{e}_{p,q}(x,y) \in \mathcal{O}(\Omega) \quad \text{given by} \quad \hat{e}_{p,q}(x,y) = \frac{x^p\, y^q}{(1-xy)^{\max\{p,q\}}} \quad \text{for all } (x,y) \in \Omega \cap \mathbb{C}^2 .$$

More precisely, let $\mathcal{A} \subseteq \mathbb{C}^{\mathbb{N}_0 \times \mathbb{N}_0}$ be the subspace of all series fulfilling $||f||_R < \infty$ for all $R \in \mathbb{R}^+$, where

$$\mathcal{A} \ni f \mapsto ||f||_R := \sum_{p,q=0}^{\infty} |f_{p,q}|\, R^{p+q} \in [0,\infty] ,$$

and endow $\mathcal{A}$ with the locally convex topology of all these seminorms $||\cdot||_R$. Then mapping a series $f \in \mathcal{A}_0$ to $\hat{f} \in \mathcal{O}(\Omega)$ like in $(*)$ is an isomorphism of Fréchet spaces.

gez. Stefan Waldmann