

1154-46-1917

J. E. Pascoe and **Ryan Tully-Doyle*** (rtullydoyle@newhaven.edu). *Automatic real analyticity and a regal proof of a commutative multivariate Löwner theorem.*

We adapt the “royal road” method used to simplify automatic analyticity theorems in noncommutative function theory to several complex variables. We show that certain families of functions must be real analytic if they have certain nice properties on one dimensional slices. Let $E \subset \mathbb{R}^d$ be open. A function $f : E \rightarrow \mathbb{R}$ is *matrix monotone lite* if $f(\varphi_1(t), \dots, \varphi_d(t))$ is a matrix monotone function of t whenever $t \in (0, 1)$, the φ_i are automorphisms of the upper half plane, and the tuple $(\varphi_1(t), \dots, \varphi_d(t))$ maps $(0, 1)$ into E . We use the “royal road” to show that a function is matrix monotone lite if and only if it analytically continues to the multi-variate upper half plane as a map into the upper half plane. Moreover, matrix monotone lite functions in two variables are locally matrix monotone in the sense of Agler-McCarthy-Young. (Received September 16, 2019)