

1154-47-2772

Victor Vinnikov* (vinnikov@math.bgu.ac.il). *Rational nc power series around a matrix centre and the free skew field.*

Noncommutative (nc) formal power series can be identified with germs of nc functions at zero. They are obviously the completion of the ring of nc polynomials. Rational nc formal power series can be characterized by a finiteness condition (the associated infinite Hankel matrix has finite rank) which is closely related to minimal realizations.

A nc rational expression that is defined at a matrix point can be expanded in generalized power series around this point, namely the Taylor–Taylor series of nc function theory. In this talk I will survey the developments of the last few years that generalize what happens around the centre zero (which by translation is of course the same as any scalar point) to the case of a general matrix centre. The main feature is that the coefficients of the power series are no longer arbitrary: they have to satisfy certain nontrivial relations depending on the centre. There is again a finiteness condition for nc rational power series that is closely related to minimal realizations. This leads in particular to an immediate construction of the skew field of nc rational functions out of the “local” rings of rational nc power series around matrix centres. (Received September 17, 2019)