Well conditioned and robust Padé approximants

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Abstract

In a recent paper, Trefethen and al. [1] have proposed a method to compute a robust Padé approximant based on the Singular Value Decomposition. They observe numerically that these approximants don’t have neither Froissart doublets nor spurious poles. It is also known [2] that for these approximants, the application going from the Taylor coefficients \( c_i \) of the function to the vector of coefficients of the numerator and denominator of the Padé approximant is continuous.

In this talk we will study forward and backward conditioning of this application and will propose a mathematical analysis of these numerical phenomena. We will show that the conditioning of underlying rectangular Toeplitz and Sylvester like matrices plays an important role.

This is a joint work with B. Beckermann.

References
