HERMITE-THUE EQUATION: PADÉ APPROXIMATIONS AND SIEGEL'S LEMMA

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Abstract. Padé approximations and Siegel's lemma are widely used tools in Diophantine approximation theory. The appropriate homogeneous matrix equation representing both methods has an $M \times (L+1)$ coefficient matrix, where $M \leq L$. Due to the Bombieri-Vaaler version of Siegel's lemma, the upper bound of the minimal non-zero solution of the matrix equation can be improved by finding a big common factor of all the $M \times M$ minors of the coefficient matrix. We will present some key ingredients how to find such a big common factor in the case of the exponential function. Further, in the case $M = L$, the existence of this common factor is a step towards understanding the nature of the 'twin type' Hermite-Padé approximations to the exponential function.