

# GROWTH AND VALUE DISTRIBUTION OF RATIONAL APPROXIMANTS

**H.-P. Blatt**

Mathematisch-Geographische Fakultät  
Katholische Universität Eichstätt-Ingolstadt  
85071 Eichstätt, Germany  
hans.blatt@ku-eichstaett.de

We investigate the growth and the distribution of  $a$ -values,  $a \in \overline{\mathbb{C}}$ , of rational approximants  $r_n$  to a function  $f$  on a compact set  $E$  in  $\mathbb{C}$ , where  $r_n = r_{n,m_n}$  is a rational function with numerator degree  $\leq n$  and denominator degree  $\leq m_n$ , as  $n \rightarrow \infty$ . Three different situations are considered:

- (1)  $f$  is meromorphic on  $E$  and  $\{r_n\}_{n \in \mathbb{N}}$  is a sequence of maximally convergent rational functions to  $f$  on  $E$ . Examples are best approximants and Padé approximants.
- (2)  $E$  is a continuum,  $f$  continuous on  $E$  and  $\{r_n\}_{n \in \mathbb{N}}$  converges geometrically to  $f$  on  $E$ .
- (3)  $f \in C[-1, 1]$ , but  $f$  is not holomorphic on  $[-1, 1]$  and  $\{r_{n,m_n}\}_{n \in \mathbb{N}}$  is a sequence of rational best approximants in the upper half of the Walsh table, i.e.,

$$m_n \leq cn \text{ and } 0 \leq c < 1.$$