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Certain Polytopes associated to Algebraic integer conjugates

In a recent paper, Bugeaud and Nguyen proved a stronger version of a Theorem of Lenstra and Shallit related to the convergents of certain algebraic integers. One of the key ingredients of their proof was certain exponential relations observed among the absolute values of the Galois conjugates of an algebraic integer. Motivated by their work, we let α be an algebraic integer of degree d and label its Galois conjugates $\alpha_0, \alpha_1, \cdots, \alpha_{d-1}$ written in decreasing order of magnitude, i.e. $|\alpha_0| \geq \cdots \geq |\alpha_{d-1}|$. Let $E_{k,d}$ be the set of $(c_1, \ldots, c_k) \in \mathbb{R}^k_{\geq 0}$ such that $|\alpha_0||\alpha_1|^{c_1} \cdots |\alpha_k|^{c_k} \geq 1$. In this talk we'll first give an explicit description of $E_{k,d}$ as a polytope with 2^k vertices. Then we will look at when the inequality is strict and give a quantitative version of the inequality depending on d and the height of the minimal polynomial of α. This is a joint work with S. Albayrak, G. Knapp and K.D. Nguyen.