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Title: On the characterization of Pethő's Loudspeaker

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For $d \in \mathbb{N}$ and $\mathbf{r} \in \mathbb{C}^d$ let $\gamma_{\mathbf{r}} : \mathbb{Z}[\mathrm{i}]^d \to \mathbb{Z}[\mathrm{i}]^d$, where $\gamma_{\mathbf{r}}(\mathbf{a}) = (a_2, \ldots, a_d, -\lfloor \mathbf{ra} \rfloor)$ for $\mathbf{a} = (a_1, \ldots, a_d)$, denote the *(d-dimensional) Gaussian shift radix system associated with* $\mathbf{r}$. $\gamma_{\mathbf{r}}$ is said to have the *finiteness property* iff all orbits of $\gamma_{\mathbf{r}}$ end up in $(0, \ldots, 0)$; the set of all corresponding $\mathbf{r} \in \mathbb{C}^d$ is denoted by $\mathcal{G}_d^{(0)}$. It has a complicated structure even for $d = 1$.
In the present paper a conjecture on the full characterization of $\mathcal{G}_1^{(0)}$ – which is known as Pethő's Loudspeaker – is formulated and proven in substantial parts. It is shown that $\mathcal{G}_1^{(0)}$ is contained in a conjectured characterizing set $\mathcal{G}_C$, while the other inclusion is partially settled algorithmically. Furthermore the circumference and area of the Loudspeaker are computed under the assumption that the conjecture holds. The proven parts of the conjecture also allow to fully identify all so-called critical and weakly critical points of $\mathcal{G}_1^{(0)}$.

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