

Title: Shift radix systems for Gaussian integers and Pethő's Loudspeaker

Author(s): Horst Brunotte , Peter Kirschenhofer and Jörg M. Thuswaldner

Recently, Akiyama *et al.* introduced so-called shift radix systems. These simple dynamical systems form a common generalization of several well-known notions of number systems like beta numeration and canonical number systems. In the present paper we generalize shift radix systems as follows: for $(r_1, \dots, r_d) \in \mathbb{C}^d$ we study mappings $\mathbb{Z}[\mathbf{i}]^d \rightarrow \mathbb{Z}[\mathbf{i}]^d$ given by

$$(x_1, \dots, x_d) \mapsto (x_2, \dots, x_d, -\lfloor r_1 x_1 + \dots + r_d x_d \rfloor).$$

where for $x \in \mathbb{C}$ we set $\lfloor x \rfloor = \lfloor \Re x \rfloor + \mathbf{i} \lfloor \Im x \rfloor$. We study basic dynamical properties of this class of mappings and relate them to known notions of number systems.

Address:

Horst Brunotte
Haus-Endt-Strasse 88
D-40593 Düsseldorf
Germany

Address:

Peter Kirschenhofer
Chair of Mathematics
and Statistics
University of Leoben
Franz-Josef-Strasse 18
A-8700 Leoben
Austria

Address:

Jörg M. Thuswaldner
Chair of Mathematics
and Statistics
University of Leoben
Franz-Josef-Strasse 18
A-8700 Leoben
Austria