

## Mathematics &gt; Commutative Algebra

# On the lifting of the Nagata automorphism

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It is proved that the Nagata automorphism (Nagata coordinates, respectively) of the polynomial algebra  $F[x,y,z]$  over a field  $F$  cannot be lifted to a  $z$ -automorphism ( $z$ -coordinate, respectively) of the free associative algebra  $K\langle x,y,z \rangle$ . The proof is based on the following two new results which have their own interests: degree estimate of  $\{Q^*_{FF}\langle x_1, \dots, x_n \rangle\}$  and tameness of the automorphism group  $\text{Aut}_Q(Q^*_{FF}\langle x,y \rangle)$ .

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