

© 2023 Heldermann Verlag
Journal of Lie Theory 33 (2023) 497–526

D. Panyushev

Institute for Information Transmission Problems, Russian Acad. of Sciences, Moscow, Russia
panyushev@iitp.ru

Combinatorial and Geometric Constructions Associated with the Kostant Cascade

Let \mathfrak{g} be a complex simple Lie algebra and $\mathfrak{b} = \mathfrak{t} \oplus \mathfrak{u}^+$ a fixed Borel subalgebra. Let Δ^+ be the set of positive roots associated with \mathfrak{u}^+ and $\mathcal{K} \subset \Delta^+$ the Kostant cascade. We elaborate on some constructions related to \mathcal{K} and applications of \mathcal{K} . This includes the cascade element $x_{\mathcal{K}}$ in the Cartan subalgebra \mathfrak{t} and properties of certain objects naturally associated with \mathcal{K} : an abelian ideal of \mathfrak{b} , a nilpotent G -orbit in \mathfrak{g} , and an involution of \mathfrak{g} .

Keywords: Root system, cascade element, abelian ideal, Frobenius algebra, nilpotent orbit.

MSC: 17B22, 17B20, 17B08, 14L30.