One-parameter semigroups of endomorphisms of a symmetric cone

KLEMEN ŠIVIC

Faculty of Mathematics and Physics
University of Ljubljana (Slovenia)
`klemen.sivic@fmf.uni-lj.si`

Let C be a closed cone in a Euclidean space V. A linear map $A\colon V \to V$ is called an endomorphism of the cone C or a positive map if $A(C) \subseteq C$. Let $\{e^{tA}; t \geq 0\}$ be a one-parameter semigroup of endomorphisms of the cone C. If C is polyhedral, then it is well-known that the generator A of the semigroup can be written as a sum of an endomorphism of C and a generator of one-parameter group of automorphisms of C. It is known that such a decomposition does not exist in general, but it is not known whether it exists if the cone C is symmetric. i.e. homogeneous and self-dual. We answer this question negatively. Explicitely, for each symmetric cone C of rank at least 3 we find a generator of a one-parameter semigroup of endomorphisms of C that cannot be written as a sum of an endomorphism of C and a generator of a one-parameter group of automorphisms of C. The work is motivated by the study of affine processes on symmetric cones.

This is a joint work with B. KUZMA (University of Primorska), M. OMLADIČ (University of Ljubljana) and J. TEICHMANN (ETH Zürich).