

**19th Workshop: Noncommutative Probability, Noncommutative Harmonic Analysis  
and Related Topics with Applications, 31.07-6.08.2022, Będlewo**

**ABSTRACT**

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**Mapping cones arising from quantum information theory**

**Abstract:** A mapping cone is a closed convex cone of positive linear maps which is closed under compositions by completely positive maps from both sides. One-sided mapping cones are defined in similar ways. We characterize mapping cones in terms of tensor products of linear maps, and get a principle to recover various known characterizations for notions like entangle breaking, decomposability,  $k$ -positivity, separability, Schmidt numbers in terms of ampliation. To do this, we exhibit an identity which connects compositions and tensor products of linear maps through Choi matrices. As another applications, we give several statements equivalent to the PPT square conjecture, and show that the definition of Choi matrix is independent of the choice of matrix units to some extent. This talk is based on two papers; [Girard, Kye and Størmer, Linear Alg. Appl. **608** (2921), 248-269, arXiv 2002.09614] and [Kye, arXiv 2204.02516].