
NATHANIEL JOHNSTON, University of Guelph

Adjoint-Invariance and Complete Positivity in Quantum Information Theory

We investigate the types of cones that can arise as completely positive maps between abstract operator systems on complex matrices. To every cone with a property that we call right-adjoint-invariance there is an associated operator system, and furthermore the associated operator system is unique. Conversely, the cone of completely positive maps on any operator system is right-adjoint-invariant cone. Several cones of linear maps satisfy this right-adjoint-invariance property and are thus completely positive between certain operator systems. We will explore several examples, such as the cones of k -positive and k -entanglement breaking maps, the cones of anti-degradable maps and k -local broadcasting maps, and the cone of local entanglement-annihilating maps.