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Covariant dilation of completely positive maps via Mackey machinery. Preliminary report.

Stinespring dilation of completely positive maps between bounded linear operators of Hilbert spaces play an important role in quantum information processing especially in modeling noise as open quantum systems. The dilation step in the proof of Stinespring result involves invoking Stone-von Neumann theorem which in turn is based on Hahn-Hellinger theorem on decomposing an observable into canonical ones upto a unitary. As Stone-von Neumann theorem can be generalized to a system of imprimitivity using Mackey machinery a covariant dilation can be formulated for completely positive maps between Poincare algebras. This result can be further generalized to dilation of maps between bimodules as Mackey machinery has undergone several evolutions in C^* -algebras settings. Hilbert bimodules are relevant in describing quasiparticles involved in topological quantum computation. We can take a step towards describing rigorously relativistically consistent open systems with quasiparticles. (Received January 13, 2022)