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Holographic quantum tasks with input and output regions. (English) 

Summary: Quantum tasks are quantum computations with inputs and outputs occurring at specified spacetime locations. Considering such tasks in the context of AdS/CFT has led to novel constraints relating bulk geometry and boundary entanglement. In this article we consider tasks where inputs and outputs are encoded into extended spacetime regions, rather than the points previously considered. We show that this leads to stronger constraints than have been derived in the point based setting. In particular we improve the connected wedge theorem, appearing earlier in [the author et al., ibid. 2020, No. 8, Paper No. 132, 34 p. (2020; Zbl 1454.83116)], by finding a larger bulk region whose existence implies large boundary correlation. As well, we show how considering extended input and output regions leads to non-trivial statements in Poincaré-AdS$_{2+1}$, a setting where the point-based connected wedge theorem is always trivial.

MSC:
83E05 Geometrodynamics and the holographic principle
81T35 Correspondence, duality, holography (AdS/CFT, gauge/gravity, etc.)

Keywords:
AdS-CFT correspondence; classical theories of gravity

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References:


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