TQC TALKS @IIIT-DELHI

Meeting Link
April 3, 8PM IST

Discreteness of Asymptotic Tensor Ranks

(joint work with Jop Briët, Matthias Christandl, Amir Shpilka and Jeroen Zuiddam)

ITAI LEIGH

ABSTRACT

Asymptotic ranks are entanglement measures that correspond to tasks of converting many copies of one state to many copies of another, in the SLOCC framework (allowing for Stochastic Local Operations and Classical Communications). The situation for tripartite states is far richer than it is for bipartite states. Here we have states that cannot be converted in the single-copy case, but looking at many copies allows for the conversion (as the number of copies tends to infinity). While the simpler, single-copy ranks are well understood, we know surprisingly little about their asymptotic counterparts. We don't even know how their images, i.e. the possible values they can take, look like. Several recent works have investigated and showed properties of these images. But the question of whether the images as subsets of the real line contain points that accumulate, meaning that converge to a limit, remained open even over finite sets of coefficients (amplitudes).

We show for a family of measures, including the asymptotic rank, asymptotic subrank and asymptotic slice-rank, that for every fixed set of coefficients that is finite, their image over all tripartite states with these coefficients is discrete, i.e. has no such converging sequences. We also show the same for the asymptotic slice-rank over all of the complex numbers (i.e. for all pure quantum states).

BIOGRAPHY

Itai is a PhD candidate in Tel-Aviv University, under the advisors Prof. Amir Shpilka and Prof. Matthias Christandl. He obtained his Master's and Bachelour's at The Hebrew University of Jerusalem.

His main research interests are Quantum Information and Computation and Tensor Ranks: basically anything that can tell us something about quantum entanglement -- which we still understand so poorly.

meet.google.com/hkk-tias-vbe

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https://braqiiit.github.io/Talks.html

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