

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Universal structure of volume-law entanglement in isolated quantum systems** SHO SUGIURA, HIROYUKI FUJITA, YUYA NAKAGAWA, Institute for Solid State Physics, University of Tokyo, MASATAKA WATANABE, Kavli Institute for the Physics and Mathematics of the Universe, University of Tokyo — In broad classes of pure quantum states, their entanglements increases in propotional to their subsystem size. This property is called the volume-law of entanglement. For example, excited energy eigenstates and states after quantum quenches obey the volume-law. However, when the subsystem size is close to the half of the size of the system, the entanglement deviates from the volume-law. We reveal its general behavior. In this talk, We focus on Renyi entropies, especially, 2nd Renyi entropy. We will analyze the volume-law of Renyi entropies using the thermal pure quantum states and obtain their exact behaviors. Our results are so universal that entanglement structures in many kinds of equilibrium states are explained by it.

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Date submitted: 11 Nov 2016

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