

*Title: Segmented strings and holographic entanglement entropy*

*AdS/CFT correspondence connects quantum entanglement and the phenomena of gravity. One result of the correspondence is provided by the so called Ryu-Takayanagi formula. This formula relates the areas of minimal surfaces of an arbitrary dimensional, asymptotically anti de Sitter space and the entanglement entropies of certain subsystems in a one lower dimensional conformal field theory living on the boundary of the AdS space. Using this result for the vacuum state of a CFT we have derived a similar formula between the area of segmented strings propagating in three, and general odd dimensional AdS spaces and the entanglement entropies of particular boundary subsystems. We have also showed that in three dimensions the positivity of string area is related to the strong subadditivity of these subsystems in the boundary theory. This duality gives a basic example how the geometry of spacetime probed by propagating strings is connected to quantum entanglement in a holographic manner.*