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# ASPECTS OF BULK RECONSTRUCTION FOR SUBREGIONS

Juan F. Pedraza

University of Amsterdam

## Abstract

In the holographic correspondence, subregion duality posits that knowledge of the mixed state of a finite spacelike region of the boundary theory allows full reconstruction of a specific region of the bulk, known as the entanglement wedge. In this talk I will discuss recent progress in this program from the point of view of hole-ography, i.e., in terms of differential entropy of the dual CFT. I will discuss subtleties that arise when employing this method for bulk subregions, focusing for simplicity in the Poincare and Rindler wedges of global AdS<sub>3</sub>. In particular, I will show that spacelike curves within a generic wedge are in fact not fully reconstructible with entanglement entropies in the corresponding boundary region. We overcome this problem by showing that the information about the nonreconstructible curve segments is encoded in a slight generalization of the concept of entanglement of purification, whose holographic dual has been discussed very recently. We introduce the notion of ‘differential purification’, and demonstrate that, in combination with differential entropy, it enables the complete reconstruction of all spacelike curves within an arbitrary entanglement wedge in any 3-dimensional bulk geometry.

**Date :** Monday, May 21, 2018

**Time:** 13:30

**Place:** IMBM Seminar Room, Boğaziçi University South Campus