Department of Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Strong Cosmic Censorship and Spacetime Entanglement

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Date: September 23, 2019

Time: 11.30 am

Venue: A-304, TIFR

We propose a necessary condition for smoothness of a quantum state in the vicinity of a null surface. We study near horizon modes defined locally near a patch of the null surface and show that, in any smooth quantum state, these modes must be correctly entangled. This test is considerably simpler than computing the full renormalized stress tensor. We implement this test for Reissner Nordstrom black holes in Anti-de-Sitter space and BTZ black holes. We provide evidence for instability of Cauchy horizon of RN-AdS in the Hartle-Hawking state. For BTZ black holes, we find that modes defined just outside the Cauchy horizon pass our test. We show that, in the extended spacetime, it is possible to define modes just inside the Cauchy horizon such that modes across the Cauchy horizon are correctly entangled.