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## Wilson Lines and Entanglement Entropy in Higher Spin Gravity

*Thursday 26 September 2013 14:00 (30 minutes)*

Holographic entanglement entropy provides a direct connection between classical geometry and quantum entanglement; however the usual prescription does not apply to theories of higher spin gravity, where standard notions of geometry are no longer gauge invariant. We present a proposal for the holographic computation of entanglement entropy in field theories dual to higher spin theories of gravity in AdS<sub>3</sub>. These theories have a Chern-Simons description, and our proposal involves a Wilson line in an infinite-dimensional representation of the bulk gauge group. In the case of spin-2 gravity such Wilson lines are the natural coupling of a heavy point particle to gravity and so are equivalent to the usual prescription of Ryu and Takayanagi. For higher spin gravity they provide a natural generalization of these ideas. We work out spin-3 gravity in detail, showing that our proposal recovers many expected results and computes thermal entropies of black holes with higher spin charge, finding agreement with previous expressions in the literature.

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