Bologna Workshop on:
CFT AND INTEGRABLE MODELS
and their applications to Quantum Field Theory, Statistical Mechanics and Condensed Matter Physics

Contribution ID: **15** Type: **Plenary Talk**

Entanglement Entropy of non-Unitary Conformal Field Theory

Wednesday, 17 September 2014 09:00 (1 hour)

In this talk I will show that the entanglement entropy of a region of large size ℓ in a one-dimensional non-unitary critical model behaves as $S \sim (c_{\text{eff}}/3)\log\ell$, where $c_{\text{eff}}=c-24\Delta>0$ is the effective central charge, c (which may be negative) is the central charge of the conformal field theory and $\Delta\leq 0$ is the lowest holomorphic conformal dimension in the theory. This result generalize the well known expressions for unitary models. I will provide a general proof, as well as numerical evidence for a non-unitary spin chain (an analytical computation using the corner transfer matrix method for a non-unitary lattice model will be discussed by Davide Bianchini). I will show how a new algebraic technique can be used for studying the branching that arise within the replica approach, and find a new expression for the entanglement entropy in terms of correlation functions of twist fields that is valid for non-unitary models. This expression will be further generalized in Olalla Castro-Alvaredo's talk to the massive Yang-Lee model of integrable quantum field theory.

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