

Abelianization of Virasoro conformal blocks at $c=1$

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Conformal blocks are essential objects to study in the 2d CFTs. They depend on the data of a vertex algebra CV , a punctured Riemann surface C , and possible decorations inserted at the punctures. The Virasoro conformal blocks are very interesting since they have many connections to other areas of math and physics. In particular, some very important Virasoro conformal blocks at $c=1$ are also known to be tau functions of some integrable system. I will describe a new way to construct Virasoro conformal blocks at $c=1$. This is closely related to the idea of nonabelianization in the study of $SL(N, \mathbb{C})$ connections by using $GL(1, \mathbb{C})$ connection in the work of Gaiotto-Moore-Neitzke and Neitzke-Hollands. I will talk about our work on relating the $c=1$ Virasoro conformal blocks on C to the “abelian” Heisenberg conformal blocks on a branched double cover of C . The main new idea in our work is the use of the spectral network on the surface C . The nonabelianization construction enables us to study the harder to get Virasoro conformal blocks using the simpler abelian objects. This is joint work in progress with Andrew Neitzke.

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