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## Nonlinear automorphism of the conformal algebra in 2D and continuous $\sqrt{T\bar{T}}$ deformations

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It depends on a single real parameter and it can be regarded as a “nonlinear  $SO(1, 1)$  automorphism.” The map preserves the form of the momentum density and naturally induces a flow on the energy density by a marginal  $\sqrt{T\bar{T}}$  deformation. In turn, the general solution of the corresponding flow equation of the deformed action can be analytically solved in closed form, recovering the nonlinear automorphism. The deformed  $\text{CFT}_2$  can also be described through the original theory on a field-dependent curved metric whose lapse and shift functions are given by the variation of the deformed Hamiltonian with respect to the energy and momentum densities, respectively. The conformal symmetries of the deformed theories can then also be seen to arise from diffeomorphisms that fulfill suitably deformed conformal Killing equations. Besides, Cardy formula is shown to map to itself under the nonlinear automorphism. As a simple example, the deformation of  $N$  free bosons is briefly addressed, making contact with recent related results and the dimensional reduction of the ModMax theory.

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