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JT-bar deformed CFTs and their holographic interpretation (Monica Guica, IPhT/CEA Saclay /Uppsala)

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It has been recently shown that the deformation of an arbitrary two-dimensional conformal field theory by the composite irrelevant operator
TT-bar, built from the components of the stress tensor, is solvable; in particular, the finite-size spectrum of the deformed theory can be obtained from that of the original CFT through a universal formula. We study a similarly universal, Lorentz-breaking deformation of two-dimensional CFTs that possess a conserved U(1) current, J. The deformation takes the schematic form JT-bar and it is interesting because it preserves an SL(2,R) x U(1) subgroup of the original global conformal symmetries. For the case of a purely (anti)chiral current, we find the finite-size spectrum of the deformed theory and study its thermodynamic properties. Next, we show that the holographic dual of JT-bar deformed CFTs for J chiral is AdS_3 with certain modified boundary conditions. We then use holography to argue that the global symmetries of the model are enhanced to a Virasoro x Virasoro x U(1) Kac-Moody algebra, just as before the deformation; the only effect of the latter is to modify the
spacetime dependence of the right-moving Virasoro generators, whose action becomes state-dependent and effectively non-local.

Summary