Abstract Submitted
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Loop quantum gravity without the Hamiltonian constraint[1] NOR-
BERT BODENDORFER, IGC, Penn State — We construct a version of loop quan-
tum gravity on a fixed constant mean curvature Cauchy slice for general relativity
conformally coupled to a scalar field. The key input is to gauge fix the Hamiltonian
constraint classically with the generator of local conformal transformations. This
generator coincides with the constant mean curvature condition in the presence of a
conformally coupled scalar field. The resulting quantum theory is a reduced phase
space quantization with respect to the Hamiltonian constraint. As an application,
it allows to calculate the entropy of a certain class of black holes based on counting
physical states. In addition, the interpretation of the geometric operators of loop
quantum gravity changes in this framework, and an effective Planck scale emerges
with a dependence on the scalar field.

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