Abstract Submitted
for the TSS21 Meeting of
The American Physical Society

Quantum Isotropy and the Reduction of Dynamics in Bianchi I MATTHEW HOGAN, Texas Tech Univ — We previously introduced a diffeomorphism-invariant definition of a homogeneous and isotropic sector of loop quantum gravity, along with a program to embed loop quantum cosmology into it. The present work works out that program in detail for the simpler, but still physically non-trivial, case where the target of the embedding is the homogeneous, but not isotropic, Bianchi I model. The diffeomorphism-invariant conditions imposing homogeneity and isotropy in the full theory reduce to conditions imposing isotropy on an already homogeneous Bianchi I spacetime. The reduced conditions are invariant under the residual diffeomorphisms still allowed after gauge fixing the Bianchi I model. We show that there is a unique embedding of the quantum isotropic model into the homogeneous quantum Bianchi I model that (a) is covariant with respect to the actions of such residual diffeomorphisms, and (b) intertwines both the (signed) volume operator and at least one directional Hubble rate. That embedding also intertwines all other operators of interest in the respective loop quantum cosmological models, including their Hamiltonian constraints. It thus establishes a precise equivalence between dynamics in the isotropic sector of the Bianchi I model and the quantized isotropic model.

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Date submitted: 15 Mar 2021 Electronic form version 1.4