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The universality of the diagonal model, or the Abelianization of the Gauss constraint in Loop Quantum Cosmology

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In this talk, we aim to discuss the abelian features of Loop Quantum Cosmology, demonstrating that the Gauss constraint can be recast into three abelian constraints.

We begin the discussion by considering nondiagonal Bianchi models, illustrating their deep connection with the diagonal case. Specifically, we show that the Hilbert space of these models factorizes into spaces that are isomorphic to the canonical Hilbert space of LQC.

Subsequently, we investigate the introduction of gauge freedom, presenting a set of abelian constraints that are equivalent to the Gauss constraint. This reveals that the previously defined Hilbert space is the gauge-invariant one, and the abelianization of the quantum theory emerges as a general result within the minisuperspace framework.

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