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Holonomy corrections in effective midisuperspace models

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We develop a systematic approach to obtain spherically symmetric midisuperspace models with modifications inherited from loop quantum gravity. We obtain a family of effective constraints that satisfy Dirac's deformation algebra and show that (scale-dependent) holonomy corrections can be consistently implemented in the presence of matter with local degrees of freedom. These deformed Hamiltonians are expected to modify the dynamics of general relativity and to avoid the singularities predicted for gravitational collapsing models.

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