

In this thesis we offer a broad introduction into loop quantum gravity against the backdrop of the quantum gravity research as a whole. We focus on both the canonical and covariant version of the theory. In the latter version we investigate the dynamics of some simple configurations in the simplified setting of Ponzano-Regge model. We ascertain that the naïve approach to define a consistent dynamics, where the path integral's partition function is computed as a sum of amplitudes corresponding to all boundary and bulk states, fails in this case, on account of an appearance of divergences. This opens up space for the utilization of some more sophisticated methods.