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Time in quantum theory, the Wheeler-DeWitt equation and the Born-Oppenheimer approximation

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We compare two different approaches to the treatment of the Wheeler-DeWitt equation and the introduction of time in quantum cosmology. One approach is based on the gauge-fixing procedure in theories with first-class constraints, while the other uses the Born-Oppenheimer method. We apply both to a very simple cosmological model and observe that they give similar predictions. We also discuss the problem of time in non-relativistic quantum mechanics and some questions concerning the correspondence between classical and quantum theories.

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