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Quantum Corrections to the Bianchi II Transition

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A semiclassical state is studied as it approaches a cosmological Bianchi II singularity, by means of the evolution of its moments. Classically this system undergoes a transition between two Bianchi I models, with a specific and well-known transition law, which is derived based on the conservation of certain physical quantities. In the quantum theory, however, these constants of motion are modified, due to effects produced by fluctuations and high-order quantum moments of the different variables. Therefore, quantum corrections arise in the transition rule. In order to compute them, we focus on the so-called locally rotationally symmetric (LRS) and vacuum cases, as a first step towards a more complete study. Indeed, the main goal will be to generalize this analysis to the Bianchi IX universe, which can be seen as a succession of Bianchi II models. Ultimately, these results will lead to a better understanding of the role played by quantum effects in the BKL conjecture.

Primary author: FERNANDEZ URIA, Sara (University of the Basque Country)

Co-authors: BRIZUELA, David (Universidad del País Vasco/Euskal Herriko Unibertsitatea); Dr ALONSO-SER-RANO, Ana (Max-Planck-Institut für Gravitationsphysik (Albert-Einstein-Institut))

Presenter: FERNANDEZ URIA, Sara (University of the Basque Country)

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