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Vector fields and Loop Quantum Cosmology

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In the context of the Loop Quantum Cosmology we have analysed the holonomy correction to the classical evolution of the simplified Bianchi I model in the presence of vector fields. For the Universe dominated by a massive vector field or by a combination of a scalar field and a vector field a smooth transition between Kasner-like solution and expanding Bianchi I Universe has been demonstrated. In this case a lack of initial singularity and a finite maximal energy density appear already at the level of General Relativity, which simulates a classical Big Bounce.

Primary author: Mr ARTYMOWSKI, Michal (IFT, University of Warsaw)

Presenter: Mr ARTYMOWSKI, Michal (IFT, University of Warsaw)

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