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Kantowski-Sachs Cosmological Model with Chaplygin Gas

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The presence of anisotropy in the early stages of the universe is a natural phenomenon to be investigated once the universe at that stage may have presented
different properties. In this project, we considered a homogeneous and anisotropic
cosmological model, Kantowski-Sachs cosmological model, with two scale factors,
a(t) and b(t). The matter content of the model consists of Chaplygin Gas, whose
equation of state is p =-\rho/A where p and are the pressure and the density of the fluid, respectively, and A a positive constant. We found the Einstein's equations for this case and solved the system of equations numerically. We varied the initial conditions and possible values for the constants in order to see if the universe would become isotropic, as we know it today. To measure the amount of anisotropy, we made use of the parameter of anisotropy and studied the fate of the universe.

Author: RODRIGUES, Marcela

Co-author: Dr DE OLIVEIRA, Gil

Presenter: RODRIGUES, Marcela

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