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Relic gravitational waves in cosmological models based on Einstein-Gauss-Bonnet gravity

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The influence of non-minimal coupling between the scalar field and the Gauss-Bonnet term on the background parameters of cosmological models and the parameters of cosmological perturbations is considered by comparison with the case of the Einstein gravity. The possibility of parametrization of this influence is shown. A procedure for reconstructing solutions of the cosmological dynamic equations obtained within the framework of General Relativity for the case of the Einstein-Gauss-Bonnet gravity is presented. As an example, some models of cosmological inflation are considered. It is shown that these cosmological models can be verified by observational constraints on the parameters of cosmological perturbations by taking into account the influence of the Gauss-Bonnet term. Also, proposed cosmological models satisfy modern observational constraints on the propagation speed of the gravitational waves.

The specificity of the spectrum of relic gravitational waves for inflationary models based on Einstein-Gauss-Bonnet gravity in comparison with the case of General Relativity is considered. The effect of increasing energy density of the high-frequency relic gravitational waves in the proposed inflationary models is analyzed. The possibility of registering relic gravitational waves predicted in these inflationary models is considered as well. To assess the possibility of detection of relic gravitational waves, the application of classical and modified Herzenstein effects and the high-frequency gravitational-optical resonance in multi-beam interferometers are analysed.

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