of the reflection coefficient in de Sitter model is grounded exclusively on the use of zero order approximation in the expansion of a particle wave function in a series on small parameter $1/R^2$, and it demonstrated that this recipe cannot be extended on accounting for contributions of higher order terms. So the result $R_{\varepsilon j} = 0$ which has been obtained from examining zero-order term persists and cannot be improved. Iteration procedure in the basic radial equation for a scalar particle is performed that provides us with differential equations describing the contributions of zero, first and second orders on $1/R^2$ respectively.

Interaction of light beams on reflection dynamic holograms in single-crystals

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The basic physical principles of the interaction of two counterpropagating light beams on dynamic reflection holograms recorded in the Denisyuk scheme in single-crystals due to the diffusion formation of space-charge field are considered. We analyze the nonlinear response relating to both phase (photorefractive) and amplitude (absorption) components of the reflection grating. Along with conventional linear electro-optic effect the additional elasto-optic contributions to the phase grating induced by secondary phenomena are taken into account. We consider two converse effects, piezoelectric and flexoelectric ones, as the causes of existence of the elastic-strain gratings in the single-crystal materials. It was shown that qualitative distinctions in photorefractive response induced by linear electro-optic effect and by converse flexoelectric effect together with the elasto-optic one are exhibited at phase demodulation in an adaptive interferometric setup utilizing interaction of two counterpropagating light beams on the reflection holograms. Based on the experiments with such interaction in the (100)-cut $Bi_{12}TiO_{20}$:Fe,Cu crystals we established that theirs flexoelectric coefficient f11 can be estimated as the value in the range from 1.9 to 5.3 nC/m.

Stimulated Brillouin scattering suppression in fibers via longitudinal acoustic velocity design

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We propose novel technique to suppress the stimulated Brillouin scattering (SBS) in fibers and fiber amplifiers for high power single frequency operations by high-accuracy acoustic waveguide structure control.