The integral equation (2.5) for the amplitudes $C(\kappa)$ assumes the following form:

$$
\Delta(\gamma, \gamma') = \frac{1}{\beta} e^{\gamma' t} \int C(\kappa) e^{i(\gamma - \gamma') \kappa} \{\exp (i\gamma_0 (e^{\gamma} - e^{\gamma''} t)) - \exp (-i\gamma_0 (e^{\gamma''} - e^{\gamma} t))\}
$$

Equation (3.19) can be simplified a little if one moves the origin to the point $\tau' = 0$. One then has

$$
\Delta = \frac{1}{\beta} e^{\gamma'' t} \int C(\kappa) e^{i\gamma_0 \kappa} \{\exp (i\gamma_0 (e^{\gamma} - 1)) - \exp (-i\gamma_0 (e^{\gamma''} - 1))\} d\kappa.
$$

To establish the final form of the integral equation (3.20), one must have a specific form of $\Delta(\gamma)$ in the case of Einstein cylindrical world.

The determination of GRG in conformally planar cosmic GRG space will be considered separately.

**LITERATURE CITED**


**THE ANISOTROPIC SCATTERING OF ELECTRONS BY DISLOCATIONS IN METALS**

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The kinetic equation for the case of anisotropic scattering of electrons by dislocations is written in the form of coupled algebraic equations for the expansion coefficients of the distribution function in spherical harmonics. The electrokinetic coefficient tensor is obtained for the case of arbitrarily oriented external fields. Departures from Matthiesen's rule due to anisotropy of the scattering process are obtained.

One of the mechanisms that causes the residual resistance of a metal is scattering by dislocations. A number of experimental papers [1-5], in which the increase in the resistance of metals in the presence of dislocations was investigated, have been devoted to this problem.

A theoretical study of the effect of dislocations on the electrical properties of solids was made in [6-8].

By writing the unknown distribution function $f(\kappa)$ in the form

$$
f(\kappa) = f(0) - \frac{\partial f(0)}{\partial \gamma} \Phi(\kappa),
$$

where $f(0)$ is the equilibrium distribution function, and $\Phi(\kappa)$ is some unknown function, the kinetic equation was solved or the relaxation time was found to which, in the case of anisotropic scattering, tensor properties were assigned in which case $\Phi(\kappa)$ was written in the simple form

$$
\Phi(\kappa) = \kappa u.
$$

$\kappa$ is the wave vector of the electron, and $u$ is a vector independent of the direction of $\kappa$. The presence of anisotropic scatterers in the crystal that, depending on the orientation of the Burgers vector with respect to the dislocation axis, are characterized by one or two separate directions in space, means that the simplest expression for $\Phi(\kappa)$ (2), which is an accurate solution of the kinetic equation only for isotropic scattering and a spherical form of the surface, will not satisfy the kinetic equation. This fact means that a further theoretical investigation of this problem is necessary.
In this paper we describe a method of solving the kinetic equation that does not use assumption (2) and that enables one to calculate the kinetic coefficients for anisotropic scattering and arbitrarily oriented external fields without including the idea of relaxation time. The method also enables one to determine the departures from Matthiesen's rule due to the anisotropic nature of the scattering.

Consider the linearized kinetic equation for the electron distribution function, which in the case of uniform electric and magnetic fields has the form

$$\frac{e E \nabla f_0}{\partial z} + \frac{e f_0}{\partial z} \frac{\partial}{\partial z} H [\nabla \times \nabla \Phi (\kappa)] = \sum_{\kappa'} W_{\kappa \kappa'} \times$$

$$X \frac{1}{h_0 t} f_0 (s_0) [1 - f_0 (s_0)] [\Phi (\kappa') - \Phi (\kappa)],$$

where $\Phi (\kappa)$ is a certain unknown function connected with the distribution function $f_0$ by relation (1); $e < 0$ is the electron charge; $T$ is the temperature; $h_0$ is Boltzmann's constant; $v$ is the electron velocity; $h$ is Planck's constant; $c$ is the velocity of light; $E$ and $H$ are the electric and magnetic fields; and $W_{\kappa \kappa'}$ is the transition probability from state $\kappa$ to state $\kappa'$ which takes into account all the electron scattering mechanisms.

To solve the kinetic equation we expand the unknown function $\Phi (\kappa)$ in series in spherical harmonics [9]

$$\Phi (\kappa) = \sum_{l m} X_{lm}(\kappa) Y_{lm}(\Theta z).$$

We will assume that the electrons are scattered by impurities, the perturbing potential of which are spherically symmetrical; by dislocations, the scattering probability of which is anisotropic; and by phonons.

We will assume that the scattering of electrons by impurities and dislocations in elastic, and that the iso-energy surface of the electron is a sphere, in which case the collision integral $I_c$ of kinetic equation (3) for elastic scattering can be written in the form

$$I_c = \frac{1}{(2\pi)^2 \hbar^2} \frac{\partial f_0}{\partial z} \sum_{l m} X_{lm}(\kappa) \int d\Omega_{\kappa'} | V_{\kappa \kappa'} |^2 | Y_{lm}(\Theta z) - Y_{lm}(\Theta z + \varphi) |,$$

where $\kappa = (\kappa_z, \Theta z, \alpha)$, $\kappa' = (\kappa_z', \Theta z', \alpha' + \varphi)$, $m$ is the effective electron mass, $d\Omega_{\kappa'}$ is the element of solid angle of the vector $\kappa'$, and $| V_{\kappa \kappa'} |^2$ is the square of the modulus of the matrix element of the potential of all the scattering centers.

We introduce an average electron-collision integral $< I_c >$ defined by the relation

$$< I_c > = \int d \kappa \left( - \frac{\partial f_0}{\partial z} \right) \int d\Omega_{\kappa} Y_{LM}(\Theta z) I_c.$$

For the case of completely degenerate statistics, the average electron-impurity collision integral has the form

$$< I_{imp} > = [C_0 (\kappa_F) - C_L (\kappa_F)] X_{LM}(\kappa_F),$$

where

$$C_L (\kappa) = \frac{m \kappa n_s}{2\pi \hbar^2} \int_0^\infty | U |^2 P_L (\cos \omega) \sin \omega d\omega,$$

$n_s (1/cm^3)$ is the impurity density, $\omega$ is the angle between $\kappa$ and $\kappa'$; $\kappa_F$ is the Fermi electron momentum, $< \kappa' | U | \kappa >$ is the matrix element of the spherically symmetrical potential of the impurity center, and $P_L$ is the Legendre polynomial.

To describe the interaction between the electrons and the boundary dislocations, we assume two electron-scattering mechanisms: scattering by the nucleus of the dislocation, and scattering by the fields of the elastic stresses. We assume that the dislocations in the crystal are situated parallel to the z axis and are distributed randomly in the x0y plane, and that scattering by individual dislocations occurs immediately. We choose the scattering potential of the nucleus in the form [8]

$$V_i = U_0 a^2 \delta (x) \delta (y).$$

344