$$\times \frac{1}{R_1'} J_0\left(\frac{2\omega r'(t-\tau)}{R_1'}\right) - \frac{4\omega^2}{R_1'} F_{3z'}' \int_0^{t-\tau} J_0\left(\frac{2\omega r'\tau'}{R_1'}\right) d\tau' \Big] d\tau\, d\bar{x}'\, d\bar{y}'\, d\bar{z}'. \qquad (10)$$

Turning to the initial coordinate system from formulas (5) and (6), let us note that due to the orthogonality of the coordinate transformation

$$\Delta_1 = \Delta, \quad R_1' = R_1, \quad d\bar{x}'\, d\bar{y}'\, d\bar{z}' = d\bar{x}\, d\bar{y}\, d\bar{z},$$

however,

$$r'^2 = R'^2 - (z' - \bar{z}')^2 = (x' - \bar{x}')^2 + (y' - \bar{y}')^2 \sin\varphi + (z' - \bar{z}')^2 \cos^2\varphi \equiv S_1^2,$$

$$\frac{\partial}{\partial x'} = \frac{\partial}{\partial x}; \quad \frac{\partial}{\partial y'} = \sin\varphi \frac{\partial}{\partial y} - \cos\varphi \frac{\partial}{\partial z}; \quad \frac{\partial}{\partial z'} = \cos\varphi \frac{\partial}{\partial y} + \sin\varphi \frac{\partial}{\partial z},$$

$$F_1' = F_1; \quad F_2' = F_2 \sin\varphi - F_3 \cos\varphi; \quad F_3' = F_2 \cos\varphi + F_3 \sin\varphi,$$

where F_1, F_2 and F_3 are equal, respectively, to the right sides of equations (7) with the elimination of primes on all letters.

Then,

$$Q = -\frac{1}{4\pi} \iiint_{-\infty}^{+\infty} \Big[\Delta \overset{0}{Q} \frac{1}{R_1} J_0\left(\frac{2\omega S_1}{R_1} t\right) + \Delta \overset{0}{Q}_t \frac{1}{R_1} \int_0^t J_0\left(\frac{2\omega S_1}{R_1} \tau\right) d\tau\Big] dx'\, dy'\, dz' +$$

$$+ \iiint_{-\infty}^{\infty} \int_0^t \Big\{[-(F_{1x} + F_{2y} + F_{3z})] \frac{1}{R_1} \frac{\partial}{\partial t} J_0\left(\frac{2\omega S_1}{R_1}(t-\tau)\right) +$$

$$+ 2\omega [\sin\varphi (F_{1y} - F_{2x}) - \cos\varphi (F_{1z} - F_{3z})] \frac{1}{R_1} J_0\left(\frac{2\omega S_1}{R_1}(t-\tau)\right) -$$

$$- \frac{4\omega^2}{R_1} [F_{2y} \cos^2\varphi + (F_{2z} - F_{3y}) \sin\varphi \cos\varphi + F_{3z} \sin^2\varphi] \times$$

$$\times \int_0^{t-\tau} J_0\left(\frac{2\omega S_1}{R_1} \tau'\right) d\tau' \Big\} d\tau\, dx'\, dy'\, dz'. \qquad (11)$$

When solving the problem for a half-spcae we will consider that when $z = 0$, $Q_z = 0$. Separating in (11) the integrals which are functions of z and z', we can represent them thus:

$$\int_{-\infty}^{\infty} \varphi(z') \psi[(z - z')^2]\, dz' = \int_0^{\infty} \{\varphi(z') \psi[(z - z')^2] + \varphi(-z') \psi[(z + z')^2]\}\, dz',$$

requiring that

$$\frac{\partial}{\partial z} \int_0^{\infty} \{\varphi(z') \psi[(z - z')^2] + \varphi(-z') \psi[(z + z')^2]\}_{z=0}\, dz' =$$

$$= \int_0^{\infty} \{\varphi(z') \psi'(z'^2)\, 2(-z') + \varphi(-z') \psi'(z'^2)\, 2z'\}\, dz' = 0,$$

we have $-\varphi(z') + \varphi(-z') = 0$, i.e.,

$$\varphi(-z') = \varphi(z').$$

This indicates that for a half-space in formula (11) we should consider the integrals of the examined type equal to

$$\int_{-\infty}^{\infty} \varphi(z') \psi[(z - z')^2]\, dz' = \int_0^{\infty} \varphi(z') \{\psi[(z - z')^2] + \psi[(z + z')^2]\}\, dz'.$$