$$u = u', \quad v = v' \sin \varphi + w \cos \varphi, \quad w = -v \cos \varphi + w \sin \varphi,$$

$$\frac{du}{dt} = \frac{du'}{dt}, \quad \frac{dv}{dt} = \frac{dv'}{dt} \sin \varphi + \frac{dw}{dt} \cos \varphi, \quad \frac{dw}{dt} = -\frac{dv'}{dt} \cos \varphi + \frac{dw'}{dt} \sin \varphi,$$

$$u' = u, \quad v' = v \sin \varphi - w \cos \varphi, \quad w' = v \cos \varphi + w \sin \varphi, \tag{6}$$

$$\frac{du'}{dt} = \frac{du}{dt}, \quad \frac{dv'}{dt} = \frac{dv}{dt} \sin \varphi - \frac{dw}{dt} \cos \varphi, \quad \frac{dw'}{dt} = \frac{dv}{dt} \cos \varphi + \frac{dw}{dt} \sin \varphi.$$

Now at the same time, $\omega_{x'} = \omega_{y'} = 0, \ \omega_{z'} = \omega$, i.e., according to (1),

$$\frac{du'}{dt} - 2\omega v' + \frac{1}{\rho} \frac{\partial p}{\partial x'} + \frac{\partial \Phi}{\partial x'} = 0,$$

$$\frac{dv'}{dt} + 2\omega u' + \frac{1}{\rho} \frac{\partial p}{\partial y'} + \frac{\partial \Phi}{\partial y'} = 0,$$

$$\tag{16}$$

$$\frac{dw'}{dt} + \frac{1}{\rho} \frac{\partial p}{\partial z'} + \frac{\partial \Phi}{\partial z'} = 0.$$

Setting, as in (1)

$$Q = RT_0 \ln \frac{p}{p_0} + \Phi, \quad c^2 = \frac{c_p}{c_v} RT_0, \quad \vartheta = \frac{T - T_0}{T_0},$$

we have

$$u'_t - 2\omega v' + Q_{x'} = -[\vartheta(Q_{x'} - \Phi_{x'}) + u'u'_x + v'u_y + w'u'_z] \equiv F'_1,$$

$$v'_t + 2\omega u' + Q_{y'} \doteq -[\vartheta(Q_{y'} - \Phi_{y'}) + u'v'_x + v'v'_y + w'v'_z] \equiv F'_2,$$

$$w'_t + Q_{z'} = -[\vartheta(Q_{z'} - \Phi_{z'}) + u'w'_x + v'w'_y + w'w'_z] \equiv F'_3, \tag{7}$$

$$\frac{1}{c^2} Q_t + u'_{x'} + v'_{y'} + w'_{z'} =$$

$$= -\frac{1}{c^2} [u'(Q_{x'} - \Phi_{x'}) + v'(Q_{y'} - \Phi_{y'}) + w'(Q_{z'} - \Phi_{z'})] \equiv F'_4$$

Considering here that the magnitude $1/c^2$ is negligibly slight, and excluding u', v', and w' from (7), we get for Q the equation

$$\begin{vmatrix} \frac{\partial}{\partial t}, & -2\omega, & 0, & \frac{\partial}{\partial x} \\ 2\omega, & \frac{\partial}{\partial t}, & 0, & \frac{\partial}{\partial y'} \\ 0, & 0, & \frac{\partial}{\partial t}, & \frac{\partial}{\partial z'} \\ \frac{\partial}{\partial x'}, & \frac{\partial}{\partial y'}, & \frac{\partial}{\partial z'}, & 0 \end{vmatrix} Q = \begin{vmatrix} \frac{\partial}{\partial t}, & -2\omega, & 0, & F'_1 \\ 2\omega, & \frac{\partial}{\partial t}, & 0, & F'_2 \\ 0, & 0, & \frac{\partial}{\partial t}, & F'_3 \\ \frac{\partial}{\partial x'}, & \frac{\partial}{\partial y'}, & \frac{\partial}{\partial z'}, & F'_4 \end{vmatrix} \equiv F^{(Q)}. \tag{8}$$

Opening the determinant on the left side we have

$$\left(\frac{\partial^2}{\partial t^2} \Delta_1 + 4\omega^2 \frac{\partial^2}{\partial z'^2} \right) Q = -F^{(Q)}, \tag{9}$$

where

$$\Delta_1 = \frac{\partial^2}{\partial x'^2} + \frac{\partial^2}{\partial y'^2} + \frac{\partial^2}{\partial z'^2}.$$

The solution of (9) for limitless space has the form [1]

$$Q = -\frac{1}{4\pi} \iiint_{-\infty}^{+\infty} \left[\Delta_1 \overset{0}{Q_1} \frac{1}{R_1} J_0 \left(\frac{2\omega r't}{R_1} \right) + \Delta_1 \overset{0}{Q_t} \frac{1}{R_1} \int_0^t J_0 \left(\frac{2\omega r'\tau}{R'} \right) d\tau \right] dx' \, dy' \, dz' +$$

$$+ \iiiint_{-\infty}^{t} \left[-(F'_{1x'} + F'_{2y'} + F'_{3z'}) \frac{1}{R_1} \frac{\partial}{\partial t} J_0 \left(\frac{2\omega r'(t-\tau)}{R_1} \right) + 2\omega (F'_{1y'} - F'_{2x'}) \times \right.$$