$$u = u', \quad v = v' \sin\varphi + w\cos\varphi, \quad w = -v\cos\varphi + w\sin\varphi,$$
$$\frac{du}{dt} = \frac{du'}{dt}, \quad \frac{dv}{dt} = \frac{dv'}{dt}\sin\varphi + \frac{dw}{dt}\cos\varphi, \quad \frac{dw}{dt} = -\frac{dv'}{dt}\cos\varphi + \frac{dw'}{dt}\sin\varphi,$$
$$u' = u, \quad v' = v\sin\varphi - w\cos\varphi, \quad w' = v\cos\varphi + w\sin\varphi, \tag{6}$$
$$\frac{du'}{dt} = \frac{du}{dt}, \quad \frac{dv'}{dt} = \frac{dv}{dt}\sin\varphi - \frac{dw}{dt}\cos\varphi, \quad \frac{dw'}{dt} = \frac{dv}{dt}\cos\varphi + \frac{dw}{dt}\sin\varphi.$$

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

$$\frac{du'}{dt} - 2\omega v' + \frac{1}{\rho}\frac{\partial p}{\partial x'} + \frac{\partial\Phi}{\partial x'} = 0,$$
$$\frac{dv'}{dt} + 2\omega u' + \frac{1}{\rho}\frac{\partial p}{\partial y'} + \frac{\partial\Phi}{\partial y'} = 0, \tag{1б}$$
$$\frac{dw'}{dt} + \frac{1}{\rho}\frac{\partial p}{\partial z'} + \frac{\partial\Phi}{\partial z'} = 0.$$

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

$$u'_t - 2\omega v' + Q_{x'} = -[\vartheta(Q_{x'} - \Phi_{x'}) + u'u'_x + v'u_y + w'u'_z] \equiv F'_1,$$
$$v'_t + 2\omega u' + Q_{y'} = -[\vartheta(Q_{y'} - \Phi_{y'}) + u'v'_x + v'v'_y + w'v'_z] \equiv F'_2,$$
$$w'_t + Q_{z'} = -[\vartheta(Q_{z'} - \Phi_{z'}) + u'w'_x + v'w'_y + w'w'_z] \equiv F'_3, \tag{7}$$
$$\frac{1}{c^2}Q_t + u'_{x'} + v'_{y'} + w'_{z'} =$$
$$= -\frac{1}{c^2}[u'(Q_{x'} - \Phi_{x'}) + v'(Q_{y'} - \Phi_{y'}) + w'(Q_{z'} - \Phi_{z'})] \equiv F'_4$$

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]

$$Q = -\frac{1}{4\pi}\iiint_{-\infty}^{+\infty}\left[\Delta_1 \overset{0}{Q}_1 \frac{1}{R'_1} J_0\left(\frac{2\omega r' t}{R'_1}\right) + \Delta_1 \overset{0}{Q}_t \frac{1}{R'_1}\int_0^t J_0\left(\frac{2\omega r'\tau}{R'}\right)d\tau\right]d\bar{x}'\,d\bar{y}'\,d\bar{z}' +$$
$$+ \iiiint_{-\infty\,0}^{\infty\,t}\left[-(F'_{1x'} + F'_{2y'} + F'_{3z'})\frac{1}{R'_1}\frac{\partial}{\partial t}J_0\left(\frac{2\omega r'(t-\tau)}{R'_1}\right) + 2\omega(F'_{1y'} - F'_{2x'}) \times\right.$$