In other words, setting

$$R_1^2 = (x-x')^2 + (y-y')^2 + (z-z')^2,$$
$$R_2^2 = (x-x')^2 + (y-y')^2 + (z+z')^2,$$
$$S_1^2 = (x-x')^2 + (y-y')^2 \sin^2\varphi + (z-z')\cos^2\varphi,$$
$$S_2^2 = (x-x')^2 + (y-y')^2 \sin^2\varphi + (z+z')^2\cos^2\varphi,$$

we find that

$$Q = -\frac{1}{4\pi}\int_{-\infty}^{+\infty}\int\int_{0}^{\infty} \Delta\overset{0}{Q}\left(\frac{J_0\left(\frac{2\omega t S_1}{R_1}\right)}{R_1} + \frac{J_0\left(\frac{2\omega t S_2}{R_2}\right)}{R_2}\right) dz'\,dx'\,dy' + \ldots \quad (12)$$

The obtained integral-differential equation, as in (1), can be solve d numerically.

In the solution of (11) the Laplacian of $\overset{o}{Q}_t$ enters into the right side. Direct practical use of this value presents considerable difficulties. As an approximate value of this magnitude we can use the value of Q_t obtained by interpolation when t = 0, allowing that with small t's we can consider $Q(t) = a_o + a_1 t + a_2(t^2/2)$, where the coefficients of a_1 are found from the following conditions:

$$\text{when } t = 0 \qquad Q = \overset{0}{Q},$$
$$\text{when } t = -\delta t \qquad Q = \overset{-1}{Q},$$
$$\text{when } t = -2\delta t \qquad Q = \overset{-2}{Q},$$

whence

$$a_0 = \overset{0}{Q};\quad a_1 = \frac{4(\overset{0}{Q} - \overset{-1}{Q}) + \overset{-2}{Q}}{2\delta t};\quad a_2 = \frac{\overset{0}{Q} - 2\overset{-1}{Q} + \overset{-2}{Q}}{\delta t^2}.$$

Thus,

$$\overset{0}{Q}_t = \frac{4(\overset{0}{Q} - \overset{-1}{Q}) + \overset{-2}{Q}}{2\delta t},$$

i.e., Q_t is determined from Q values at moments T ≠ 0, $-\delta t$, $-2\delta t$.

THE RECURRENT SYSTEM FOR SOLVING THE PROBLEM OF FORECASTING WITH CONSIDERATION OF INTERNAL FRICTION

Let us examine the system of equations

$$\frac{du}{dt} + 2\omega\cos\varphi w - 2\omega\sin\varphi v - \nu\Delta u + \frac{1}{\rho}\frac{\partial p}{\partial x} + \frac{\partial\Phi}{\partial x} = 0,$$
$$\frac{dv}{dt} + 2\omega\sin\varphi u - \nu\Delta v + \frac{1}{\rho}\frac{\partial p}{\partial y} + \frac{\partial\Phi}{\partial y} = 0,$$
$$\frac{dw}{dt} - 2\omega\cos\varphi u - \nu\Delta w + \frac{1}{\rho}\frac{\partial p}{\partial z} + \frac{\partial\Phi}{\partial z} = 0, \quad (13)$$
$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0.$$

Substitution of variables according to the formulas