FORM TO SPECIFY INPUT DATA FOR
GRAVITY MODEL GCONST

A constant gravititational field (independent of height, longitude, latitude, and time) and the angular velocity of the Earth to calculate Coriolis force
Specify–
the model check for GCONST = ______1.0______ (w600)
the input data-format code = ____________ (w601)
an input data-set identification number = ____________ (w602)
an 80-character description of the model with parameters:

____

and the model values:
constant gravitational field, $|g|$ = ________ (w603) km/s^2, m/s^2 (9.81 m/s^2 suggested)
angular velocity of Earth, Ω = ____________ (w604) rad/s, Hz, s
(86164.091 s suggested)
factor for $4(\mathbf{k_A} \cdot \tilde{\mathbf{\Omega}})^2$ vorticity term = ____________ (w605) (1.0 suggested)
factor for $4(\mathbf{k} \cdot \tilde{\mathbf{\Omega}})^2$ vorticity term = ____________ (w606) (1.0 suggested)
factor for $4k_z^2\tilde{\Omega}_z^2$ vorticity term = ____________ (w607) (0.0 suggested)
factor for $-4\omega^2\tilde{\mathbf{\Omega}}^2/C^2$ vorticity term = ____________ (w608) (1.0 suggested)
factor for $-4\omega^2\tilde{\Omega}_z^2/C^2$ vorticity term = ____________ (w609) (0.0 suggested)
factor for $4\omega\tilde{\mathbf{\Omega}} \times \mathbf{\Gamma} \cdot \mathbf{k}$ vorticity term = ____________ (w610) (1.0 suggested)
Setting w605, w606, w608, and w610 to 1 and all others to 0 gives the following dispersion relation:

$$\begin{aligned}(\mathbf{k}^2 + \mathbf{k}_A^2)(N^2 - \omega^2) - (k_z^2 + k_A^2)\, N^2 \\ +4(\mathbf{k} \cdot \tilde{\mathbf{\Omega}})^2 + 4(\mathbf{k}_A \cdot \tilde{\mathbf{\Omega}})^2 + 4\omega\tilde{\mathbf{\Omega}} \times \mathbf{\Gamma} \cdot \mathbf{k} + 1/C^2(\omega^4 - 4\omega^2\tilde{\mathbf{\Omega}}^2) = 0\ ,\end{aligned} \tag{1}$$

where N is the Brunt-Väisälä frequency, $\omega = \sigma - \mathbf{k} \cdot \mathbf{U}$ is the intrinsic frequency, σ is the wave frequency, $\mathbf{U}$ is the background fluid velocity, $\mathbf{k}$ is the wavenumber, $\tilde{\mathbf{\Omega}} = \mathbf{\Omega} + \zeta/4$, where $\zeta = \nabla \times \mathbf{U}$ is vorticity, $\mathbf{\Omega}$ is the Earth's angular velocity, $\mathbf{\Gamma} \equiv \nabla\rho/(2\rho) - \nabla p/(\rho C^2)$ is the vector generalization of Eckart's coefficient, C is sound speed, $\mathbf{k}_A \equiv \nabla\rho/(2\rho)$, where ρ is density, k_z is the component of $\mathbf{k}$ in the direction of $\tilde{\mathbf{g}}$.
Setting w605, w607, and w609 to 1 and all others to 0 gives the following dispersion relation:

$$(k_x^2 + k_y^2)(N^2 - \omega^2) - (\omega^2 - 4\Omega_z^2)(k_z^2 + \mathbf{k}_A^2 - \frac{\omega^2}{C^2}) = 0, \tag{2}$$

where N is the Brunt-Väisälä frequency, $\omega = \sigma - \mathbf{k} \cdot \mathbf{U}$ is the intrinsic frequency, σ is the wave frequency, $\mathbf{U}$ is the background fluid velocity, $\mathbf{k}$ is the wavenumber, k_z is its vertical component, k_x and k_y are its horizontal components, Ω_z is the vertical component of the Earth's angular velocity, C is sound speed, and $\mathbf{k}_A \equiv \nabla\rho/(2\rho)$, where ρ is density.
The vorticity term is not yet implemented.

OTHER MODELS REQUIRED: none.