NOTATION

Variables are normally set in italics, constants (e.g, π, i) in roman (i.e., upright), differential operators in roman, vectors in bold, and tensors in bold sans serif. Thus, vector variables are in bold italics, vector constants (e.g., unit vectors) in bold upright, and tensor variables are in bold slanting sans serif. A subscript denotes a derivative only if the subscript is a coordinate, such as x, y, z or t, or when so denoted in the text. A subscript 0 generally denotes a reference value (e.g., ρ_0). The components of a vector are denoted by superscripts. If a fraction contains only two terms in the denominator then brackets are not always used; thus $1/2\pi = 1/(2\pi) \neq \pi/2$.

The lists below contain only the more important variables or instances of ambiguous notation, in quasi-alphabetical order, first of Roman characters and then of mainly Greek characters and operators. Distinct meanings are separated with a semi-colon.

Variable	Description
a	Radius of Earth.
b	Buoyancy, $-g\delta\rho/\rho_0$ or $g\delta\theta/\widetilde{\theta}$.
B	Planck function, often σT^4.
$\boldsymbol{c}_g$	Group velocity, (c_g^x, c_g^y, c_g^z).
c_p	Phase speed; heat capacity at constant pressure.
c_v	Heat capacity at constant volume.
c_s	Sound speed.
f, f_0	Coriolis parameter, and its reference value.
$\boldsymbol{g}$, g	Vector acceleration due to gravity, magnitude of $\boldsymbol{g}$.
g	Gibbs function.
$\mathbf{i}, \mathbf{j}, \mathbf{k}$	Unit vectors in (x, y, z) directions.
i; i	An integer index; square root of minus one.
I	Internal energy.
$\boldsymbol{k}$	Wave vector, with components (k, l, m) or (k^x, k^y, k^z).
k_d	Wave number corresponding to deformation radius.
L_d	Deformation radius.
L, H	Horizontal length scale, vertical (height) scale.
m	Angular momentum about the Earth's axis of rotation.
N	Buoyancy, or Brunt–Väisälä, frequency.
p, p_R	Pressure, and a reference value of pressure.
Pr	Prandtl ratio, f_0/N.
q	Quasi-geostrophic potential vorticity; water vapour specific humidity.
Q	Potential vorticity (in particular Ertel PV).
$\dot{\mathrm{Q}}$	Rate of heating.
Ra	Rayleigh number.
Re ; Re	Real part of expression; Reynolds number, UL/ν.
Ro	Rossby number, U/fL.
S	Salinity; source term on right-hand side of an evolution equation.
S_o, $\boldsymbol{S}_o$	Solenoidal term, solenoidal vector.
T	Temperature; scaling value for time.
t	Time.
$\boldsymbol{u}$	Two-dimensional (horizontal) velocity, (u, v).
$\boldsymbol{v}$	Three-dimensional velocity, (u, v, w).
w	Vertical velocity; water vapour mixing ratio.
x, y, z	Cartesian coordinates, usually in zonal, meridional and vertical directions.
Z	Log-pressure, $-H \log p/p_R$; scaling for z.

Variable	Description
$\mathcal{A}$	Wave activity.
α	Inverse density, or specific volume; aspect ratio.
β; β^*	Rate of change of f with latitude, $\partial f/\partial y$; $\beta^* = \beta - u_{yy}$
$\beta_T, \beta_S, \beta_p$	Coefficient of expansion with respect to temperature, salinity and pressure, respectively.
ϵ	Generic small parameter (epsilon).
ε	Cascade or dissipation rate of energy (varepsilon).
η	Specific entropy; perturbation height; enstrophy cascade or dissipation rate.
$\boldsymbol{\mathcal{F}}$	Eliassen Palm flux, $(\mathcal{F}^y, \mathcal{F}^z)$.
γ	The ratio c_p/c_v; Vorticity gradient, e.g., $\beta - u_{yy}$.
Γ	Lapse rate (sometimes subscripted, e.g., Γ_z, but here this does not denote a differential).
κ	Diffusivity; the ratio R/c_p.
$\mathcal{K}$	Kolmogorov or Kolmogorov-like constant.
Λ	Shear, e.g., $\partial U/\partial z$.
μ	Viscosity; chemical potential.
ν	Kinematic viscosity, μ/ρ.
υ	Meridional component of velocity.
$\mathcal{P}$	Pseudomomentum.
ϕ	Pressure divided by density, p/ρ.
φ	Passive tracer.
Φ	Geopotential, usually gz; scaling value of ϕ.
Π	Exner function, $\Pi = c_pT/\theta = c_p(p/p_R)^{R/c_p}$; an enthalpy-like quantity.
$\boldsymbol{\omega}$	Vorticity.
$\Omega, \boldsymbol{\Omega}$	Rotation rate of Earth and associated vector.
ψ	Streamfunction.
ρ	Density.
ρ_θ	Potential density.
σ	Layer thickness, $\partial z/\partial\theta$; Prandtl number ν/κ; measure of density, $\rho - 1000$.
$\boldsymbol{\tau}$	Stress vector, often wind stress.
$\tilde{\boldsymbol{\tau}}$	Kinematic stress, $\boldsymbol{\tau}/\rho$.
τ	Zonal component or magnitude of wind stress; eddy turnover time; optical depth.
θ; Θ	Potential temperature; generic thermodynamic variable, often conservative temperature.
ϑ, λ	Latitude, longitude.
ζ	Vertical component of vorticity.
$\left(\dfrac{\partial a}{\partial b}\right)_c$	Derivative of a with respect to b at constant c.
$\left.\dfrac{\partial a}{\partial b}\right\|_c$	Derivative of a with respect to b evaluated at $b = c$.
∇_a	Gradient operator at constant value of coordinate a. Thus, $\nabla_z = \mathbf{i}\partial_x + \mathbf{j}\partial_y$.
$\nabla_a\cdot$	Divergence operator at constant value of coordinate a. Thus, $\nabla_z\cdot = (\mathbf{i}\partial_x + \mathbf{j}\partial_y)\cdot$.
$\nabla^\perp$	Perpendicular gradient, $\nabla^\perp\phi \equiv \mathbf{k}\times\nabla\phi$.
curl_z	Vertical component of $\nabla\times$ operator, $\mathrm{curl}_z\boldsymbol{A} = \mathbf{k}\cdot\nabla\times\boldsymbol{A} = \partial_x A^y - \partial_y A^x$.
$\dfrac{\mathrm{D}}{\mathrm{D}t}$	Material derivative (generic).
$\dfrac{\mathrm{D}_g}{\mathrm{D}t}$	Material derivative using geostrophic velocity, for example $\partial/\partial t + \boldsymbol{u}_g\cdot\nabla$.