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## List of Abbreviations and Symbols

### Abbreviations

CFD	Computational fluid dynamics
DNS	Direct numerical simulation
LES	Large Eddy Simulation
RANS	Reynolds–Averaged Navier–Stokes
RSM	Reynolds stress model
ASM	Algebraic stress model
LGS	Line Gauss–Seidel method
TDMA	Tri–diagonal matrix algorithm
SIMPLE	Semi–Implicit Method

### Symbols

$\bar{u}$	Mean velocity components, m/s
$\overline{u_i}$	Velocity fluctuation, m/s
$\bar{P}$	Pressure, N/m <sup>2</sup>
$x_i$	Coordinate axis ( $x, y, z$ )
$\rho$	Density, kg/m <sup>3</sup>
$g_i$	Gravitational acceleration vector, m/s <sup>2</sup>
$\beta$	Thermal expansion coefficient, K <sup>-1</sup>
$\mu$	Viscosity, N·s/m <sup>2</sup>
$\mu_t$	Turbulent or eddy viscosity, N·s/m <sup>2</sup>
$\bar{T}$	Mean temperature, K
$\overline{T}$	Temperature fluctuation, K
$\tau_{ij}$	Reynolds stress, N/m <sup>2</sup>
$\Gamma_t$	Turbulent scalar diffusivity
$\sigma_H$	Turbulent–Prandtl number
$\delta_{ij}$	Kronecker delta
$k$	Turbulent kinetic energy



### List of Abbreviations and Symbols (Continued)

$\nu_t$	Kinematics turbulent viscosity, $\text{m}^2/\text{s}$
$\ell$	Turbulent length scale, m
$C$	Dimensionless constant of proportionality
$y$	Coordinate normal to the wall, m
$\kappa$	von Karman's constant
$k$	Turbulent kinetic energy
$\varepsilon$	Dissipation rate
$P$	Shear production term
$G$	Buoyancy production term
$\Pi_{ij}$	Pressure-strain correlation term
$\Omega_{ij}$	Rotation term
$D_{it}$	Diffusion term
$\omega_k$	Rotation vector
$e_{ijk}$	Alternation symbol
$R_{ij}$	Reynolds stress gradients
$\phi$	Scalar variable value