List of Symbols and Notation

A	Amplitude, absorption area [m^2]
B	Bending stiffness of beam [Nm^2], strength of magnetic field [Vs/m]
B'	Bending stiffness of plate [Nm],
C	Capacitance [F], specific heat [J/(kg·K)], rotational stiffness
D	Modulus of elasticity (longitudinal stiffness) [N/m^2]
D'	Real part of complex longitudinal stiffness $\underline{D}$
D''	Imaginary part of complex longitudinal stiffness $\underline{D}$
E	Young's modulus [N/m^2], energy [J]
$E(\ldots)$	Abbreviation for exponential function
E_x, E_z	Young's modulus in x- and z-directions
E_{kin}	Kinetic energy
E_{pot}	Potential energy
F	Force [N]
F_0	Exciting point force
$F_{x,\,y,\,z}$	Force components in x-, y- and z-directions
F_W	Transducer force
F'	Force per unit length
G	Shear modulus [N/m^2]
H	Hamiltonian
$H_n^{(2)}(\ldots)$	Hankel function of second kind and order n
I	Second area moment [m^4], impulse [Ns]
I'	$h^2 / 12$
J	Intensity [W/m^2]
$J_{x,\,y,\,z}$	Intensity components in x-, y- and z-directions
$J_n(\ldots)$	Bessel function of order n
K	Piezoelectric transducer constant, compressional modulus [N/m^2], shear stiffness
L	Level [dB], inductance [H]
L_p	Sound pressure level
L_W	Sound power level
M	Moment [Nm]

N	Integer number, number of modes
Q	Electrical charge [C], complex power [W]
Q_x, Q_z	Cross-sectional force components
R	Electrical resistance [Ω], transmission loss, radius, distance
S	Area [m^2]
T	Period, reverberation time [s], torsional stiffness [Nm^2], tensional force
U	Voltage [V], flow velocity, speed [m/s]
U_W	Transducer voltage
V	Reactive power [W]
W	Active power [W], work [J]
W_{diss}	Dissipated power
W'	Power per unit length [W/m]
Y	Mobility
$Y_\sim$	Wave mobility
Z	Impedance
$Z_\sim$	Wave impedance
Z_E	Electrical impedance [Ω]
a	Radius of cylinder or sphere [m], acceleration [m/s^2]
a_{11}, a_{12}, ...	Auxiliary quantities
b	Width [m], half-power bandwidth
c	Wave and phase speed [m/s]
c_0	Wave speed in ambient fluid
c_B	Bending wave speed
c_g	Group speed
c_L	Longitudinal wave speed (3D)
c_{LI}	Longitudinal wave speed (2D)
c_{LII}	Longitudinal wave speed (1D)
c_R	Rayleigh wave speed
c_T	Transversal or shear wave speed
$c_{\mu\nu}$	Coupling factor
d	Thickness [m]
e	Base of natural logarithm, energy density [J/m^3]
f	Frequency [Hz]
f_n	n-th resonance frequency
f_c	Critical frequency, coincidence frequency
g	Gravitational acceleration, shear parameter, propagation constant
h	Plate thickness [m]

i	Electrical current [A]
i_W	Transducer current
j	Imaginary unit
k	Integer number, wavenumber [1/m]
k'	Real part of complex wavenumber $\underline{k}$
k''	Imaginary part of complex wavenumber $\underline{k}$
$k_{x,\,y,\,z}$	Wavenumber components in x-, y- and z-directions
k_0	Wavenumber in ambient fluid
k_B	Bending wavenumber
k_L	Longitudinal wavenumber
k_r	Wavenumber in radial direction
k_R	Rayleigh wavenumber
k_T	Shear wavenumber
i, **j**, **k**	Unit vectors in x-, y- and z-directions
l	Length [m]
l_m	Mean free path [m]
m	Mass [kg]
m'	Mass per unit length [kg/m]
m''	Mass per unit area [kg/m^2]
n	Refraction index, integer number
p	Pressure, force per unit area, sound pressure [N/m^2]
q	Volume velocity [m^3/s]
r	Frictional resistance [Ns/m], radius [m], reflection factor
r_{LL}, r_{LT}, r_{TT}	Reflection factors for longitudinal and transversal waves
r_0, r_l	Reflection factors at the ends of a rod
r_j	Reflection factor for evanescent wave
s	Stiffness [N/m], arc length [m]
s''	Stiffness per unit area [N/m^3]
s	Displacement vector
t	Time [s], tranmission coefficient
t_j	Near-field transmission coefficient
u	General field variable
v	Particle velocity [m/s]
$v_{x,y,z}$	Particle velocity components
v_w	Transducer velocity
w	Rotational or angular particle velocity [1/s]
∇^2	Laplace operator
Δ	Difference, time step, thickness ratio

ΔN	Number of modes in a frequency band
Θ	Mass moment of inertia [kgm^2]
Θ'	Mass moment of inertia per unit length [kgm]
Λ	Logarithmic decrement, norm of eigenfunction [kg], thermal conductivity [W/(m·K)]
$\Pi(\ldots)$	Propagation function
Φ	Scalar potential, magnetic flux [Vs]
Ψ	Vector potential
α	Eigen-value, transducer constant, absorption factor, radiation parameter, auxiliary quantity
β	Cross-sectional rotation, excitation parameter, auxiliary quantity
γ	Shear angle, phase shift, transducer constant, Green's function
δ	Variation, decay constant, dilatation, acoustic boundary layer thickness
$\delta(\ldots)$	Dirac's delta function
ε	Strain, auxiliary quantity
$\varepsilon_{x,\,y,\,z}$	Strain in x-, y- and z-directions
ζ	Displacement in z-direction [m], radiation fraction
η	Displacement in y-direction, lossfactor
$\eta_{\mu\nu}$	Coupling lossfactor
ϑ	Angle of incidence, auxiliary quantity
κ	Auxiliary quantity
λ	Wavelength [m]
λ_B	Bending wavelength
λ_L	Longitudinal wavelength
λ_c	Wavelength at the critical frequency
λ_ν	Lagrange's multiplier
μ	Poisson's ratio, auxiliary quantity
ν	Kinematic viscosity [m^2/s], non-dimensional frequency, integer number, auxiliary quantity
ξ	Displacement in x-direction
ρ	Density [kg/m^3], reflection efficiency
ρ_0	Density of ambient fluid
ρ_{LL}, ρ_{LT}, ρ_{TT}	Reflection efficiences for longitudinal and transversal waves

σ	Normal stress [N/m^2], relaxation time, thickness ratio
$\sigma_{x,\,y,\,z}$	Stress components in x-, y- and z-directions
τ	Shear stress [N/m^2], radiation efficiency, transmission efficiency
$\tau_{xy},\ \tau_{yz},\ \tau_{zx}$	Shear stress components
φ	Phase angle
$\varphi(\ldots)$	Eigen-function
ϕ	Phase angle
χ	Angle of rotation
ψ	Angle, auxiliary quantity
ω	Angular frequency
$\underline{\omega}_n$	Resonance frequency
$\underline{x}$	Averaged quantity
x	Complex quantity
$\hat{x}$	Peak value, Fourier transformed variable
$\dot{x}, \ddot{x}$	First and second time derivative
x', x''	First and second spatial derivative
$\lvert x \rvert$	Absolute value
x^*	Complex conjugated quantity
Re[...]	Real part
Im[...]	Imaginary part
x, y, z	Cartesian co-ordinates
r, φ, z	Cylindrical co-ordinates
R, ϑ, φ	Spherical co-ordinates

Index