

List of symbols

a	Thermal diffusivity [m^2s^{-1}]
A	Heat generation
c	Specific heat [$kJkg^{-1}K^{-1}$]
C^T	Transpose of C
L	Latent heat of fusion [$kJkg^{-1}$]
K	Thermal conductivity [$Wm^{-1}K^{-1}$]
l	Characteristic length [m]
P	Pressure [Nm^2]
q	Heat flux
Q	Line heat sink [Wm^{-1}]
r	Spatial co-ordinate [m]
$s(t)$	Moving interface [m]
T	Temperature [$^{\circ}C$]
t	Time [s]
U	Internal energy [J]
V	Volume [m^3]
Dimensionless variable	
a_{12}	Ratio of two phase thermal diffusivity
Bi	Biot number
f_s	Solid fraction present at mushy region
f_{su}	Solid fraction present at solid-mush boundary
f_{su_1}	Solid fraction present at mush-liquid boundary
K_{12}	Ratio of two phase thermal conductivity
Ki	Kirpichev number
Pd	Predvoditelev number
Ste	Stefan number
x, y, z	Dimensionless space coordinate
Fo	Fourier number
Greek symbols	
α	Specific heat coefficient

β	Thermal conductivity coefficient
θ	Dimensionless temperature
τ_q	Relaxation time in flux
λ	Dimensionless phase change front/moving layer thickness
ρ	Density [kgm^{-3}]
ξ	Dimensionless space co-ordinate
Subscripts	
phase	1 and 2 solid, liquid respectively
f	freezing
i	initial
l	liquid
m	melting
s	surface
0	at the surface, $x = 0$
Abbreviations	
b.c.	boundary condition
erf	error function
FELWGM	Finite Element Legendre Wavelet Galerkin Method
PCM	Phase change material
WCM	Wavelet collocation method
WGM	Wavelet Galerkin method
$\langle . \rangle$	Inner product
$\ \cdot \ _2$	L^2 norm