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NOMENCLATURE

A	dimensionless fitting coefficient
$Aziz\ Value$	calculating pressure gradient value by Aziz model, kPa/m
$Aziz-I\ Value$	calculating pressure gradient value by Aziz-I model, kPa/m
$Aziz-RF\ Value$	improved Aziz residual value, kPa/m
B	dimensionless fitting coefficient
C	dimensionless fitting coefficient
c_1	learning factor
c_2	learning factor
CD	length of the corresponding interval of the mutation
D	problem dimension
eps	accuracy control
$E\ Value$	experimental pressure gradient, kPa/m
F	dimensionless fitting coefficient
f_i	fitness
$fbest$	optimum value
$gbest$	global optimal positions of the particle swarm
HDT	maximum iterations of chaos search
k	adjustment coefficient of weight
lb	lower limit of the initial search space
ub	upper limit of the initial search space
$MaxDT$	maximum iterations
N	group size
$pbest_i$	experienced optimal positions of particles
r	fitting value of the prediction residual of Aziz model, kPa/m
$rand1$	uniform random numbers over the interval [0,1]
$rand2$	uniform random numbers over the interval [0,1]
s	numbers of the particles which is needed to be replaced
t	current iterations
v_{max}	speed limit
v	particle velocity
w	weight
w_{max}	maximum of the weight
w_{min}	minimum of the weight
x	particle position
x_i	the i-th D-dimensional particle
z	gas liquid ratio, m^3/m^3

Subscripts

i	serial number of the particle
j	the number of liquid flow rates