**>> RES expression (integTime.m)**

Reaction-diffusion equation:

(1)

Aim → Steady state of soluble components (), that is,

(2)

Applying centred second order finite differences and Kronecker product,

(3)

and considering Dirichlet (or first-type) boundary condition:

(4)

The units of this expression are [mol·m-3·h-1]. We would like the same expression with concentration units [mol·L, M]. For this, we multiply every term of equation (or *RES* expresion) by characteristic diffusion time (). Finally we convert mol·m-3 to mol·L (1 mol·m‑3 = 1000 mol·L).

(5)

We assume that the system has reached the pseudo-steady state when RES is less than Abs\_tol (1x10-6 M).

(6)

Where is the substrate concentration at steady-state.

**Units**

**Stability condition**

**Discretised bacteria condition**