input : $y(t)$ as a vector $\{w_1, w_2, ..., w_N, L^2\}$
output: $y'(t)$ as a vector $\{\mathcal{A}_1, \mathcal{A}_2, ..., \mathcal{A}_N, \mathcal{B}\}$

$\frac{\partial y_1}{\partial x_1}, \frac{\partial^2 y_1}{\partial x_1^2} \longleftarrow$ left BC $(y(t))$;
$w_0,\ \frac{\partial y_N}{\partial x_N}, \frac{\partial^2 y_N}{\partial x_N^2} \longleftarrow$ right BC $(y(t))$;
for $i \leftarrow 2$ **to** $N-1$ **do**
  $\frac{\partial y_i}{\partial x_i}, \frac{\partial^2 y_i}{\partial x_i^2} \longleftarrow$ derivative approximation scheme $(y(t))$;
end
for $i \leftarrow 1$ **to** N **do**
  $y_i' \leftarrow \mathcal{A}_i \left(y(t), w_0, \frac{\partial y_i}{\partial x_i}, \frac{\partial^2 y_i}{\partial x_i^2}, q_l(t, x_i)\right)$;
end
$y'_{N+1} \leftarrow \mathcal{B}\,(w_0)$;