1) transformation in a continuous-time system

$$\begin{cases} \mathbf{y}(k+1) = P^M\left(\mathbf{y}(k) + \mathbf{g}(\mathbf{x}(k)) - \mathbf{g}(\mathbf{x}(k-1))\right) \\ \mathbf{z}(k+1) = P^M\left(\mathbf{z}(k) + \mathbf{h}(\mathbf{x}(k)) - \mathbf{h}(\mathbf{x}(k-1))\right) \\ \mathbf{x}(k+1) = (1-\varepsilon)\mathbf{x}(k) + \varepsilon\dfrac{\mathbf{y}(k+1)}{\mathbf{z}(k+1)} \end{cases}$$

$$\downarrow P = I - K, M = 1$$

$$\begin{cases} \varepsilon\dot{\mathbf{v}}(t) = -\mathbf{v}(t) + \mathbf{g}\left(\mathbf{x}(t)\right) \\ \varepsilon\dot{\mathbf{w}}(t) = -\mathbf{w}(t) + \mathbf{h}\left(\mathbf{x}(t)\right) \\ \varepsilon\dot{\mathbf{y}}(t) = -K\mathbf{y}(t) + (I-K)\left[\mathbf{g}\left(\mathbf{x}(t)\right) - \mathbf{v}(t)\right] \\ \varepsilon\dot{\mathbf{z}}(t) = -K\mathbf{z}(t) + (I-K)\left[\mathbf{h}\left(\mathbf{x}(t)\right) - \mathbf{w}(t)\right] \\ \dot{\mathbf{x}}(t) = -\mathbf{x}(t) + \dfrac{\mathbf{y}(t)}{\mathbf{z}(t)} \end{cases}$$