**Neural network of LIF neurons with synaptic connections and gap-junctions**

**Single neuron dynamics**

(1)

Spike generation

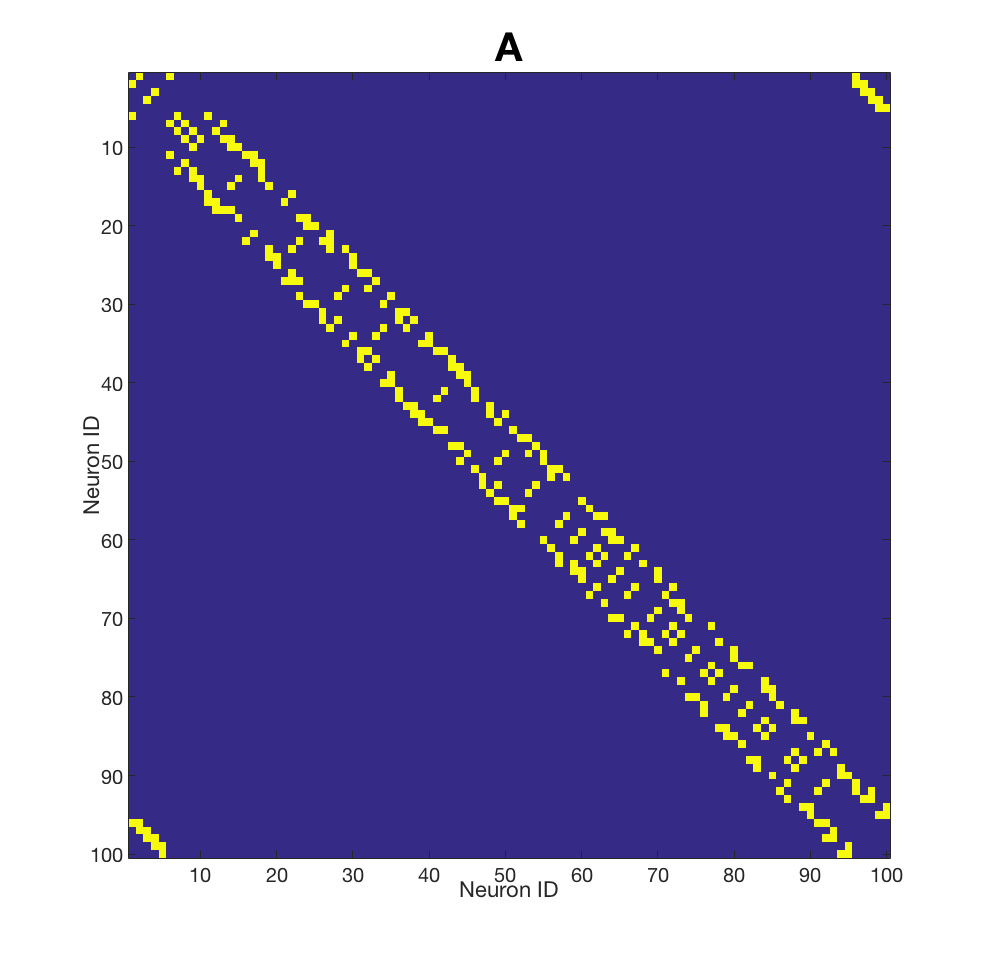
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**Synaptic current**

(2)

**Gap-junction current**

(3)

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**External input**

**Connectivity**

N – number of neurons

sp – spikes in the spike train

**Indexes**

k – index over neurons

m – index of connected neurons

i – index over synapses

j – index over spikes

Summation over synaptic connections is organised by sparse connectivity matrix **A**

Gap-junctions are located in the same places

as synaptic connections according to matrix **A**