

Supplemental Movie Details

1. Supplemental Movie 1 demonstrates the skyrmion motion in the monolayer neuron device for the square pulse with current density $J=10 \text{ MA/cm}^2$.
2. Supplemental Movie 2 demonstrates the skyrmion motion in the monolayer neuron device for the square pulse with current density $J=20 \text{ MA/cm}^2$.
3. Supplemental Movie 3 demonstrates the skyrmion motion in the monolayer neuron device for the square pulse with current density $J=30 \text{ MA/cm}^2$.
4. Supplemental Movie 4 demonstrates the skyrmion motion in the bilayer neuron device for the square pulse with current density $J=30 \text{ MA/cm}^2$ alongwith a reset current density of $J=-60 \text{ MA/cm}^2$.
5. Supplemental Movie 5 demonstrates the skyrmion motion in the bilayer neuron device for the irregular square pulses.
6. Supplemental Movie 6 demonstrates the skyrmion motion in the bilayer neuron device for the biologically similar pulses.
7. Supplemental Movie 7 demonstrates the motion of the skyrmions in the bilayer synapse device for LTP and LTD operations. Pulses are shown in normalized scale.