Magnetic skyrmion transistor: skyrmion motion in a voltage-gated nanotrack

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SUPPLEMENTARY INFORMATION

Supplementary Movie Captions

In all supplementary movies, the voltage-gated region is denoted by the shadow pattern.

Supplementary Movie 1. The nanotrack with spin current density j = 5 MA/cm^2 as well as voltage-controlled PMA $K_{uv} = K_u$ in the voltage-gated region with sharp transition profile, corresponding to Figure 2a of the main text. The skyrmion passes the gated region.

Supplementary Movie 2. The nanotrack with spin current density j = 5 MA/cm^2 as well as voltage-controlled PMA $K_{uv} = 1.1K_u$ in the voltage-gated region with sharp transition profile, corresponding to Figure 2a of the main text. The skyrmion cannot pass the gated region.

Supplementary Movie 3. The nanotrack with spin current density j = 5 MA/cm^2 as well as voltage-controlled PMA $K_{uv} = 0.9K_u$ in the voltage-gated region with sharp transition profile, corresponding to Figure 2a of the main text. The skyrmion cannot passes the gated region.

Supplementary Movie 4. The nanotrack with spin current density j = 6 MA/cm^2 as well as voltage-controlled PMA $K_{uv} = 1.05K_u$ in the voltage-gated region with sharp transition profile, corresponding to Figure 2b of the main text. The skyrmion passes the gated region.

Supplementary Movie 5. The nanotrack with spin current density j = 10 MA/cm^2 as well as voltage-controlled PMA $K_{uv} = 0.9K_u$ in the voltage-gated region with sharp transition profile, corresponding to Figure 2c of the main text. The skyrmion passes the gated region.