

Description of Additional Supplementary Files

File name- Supplementary Movie 1

File description- This movie, using the example of a π -skyrmion, illustrates how a smooth pulse (11) efficiently suppresses the breathing mode of magnetic solitons.

File name- Supplementary Movie 2

File description- This movie shows the first 100 ns of dynamics for low-symmetry skyrmions exhibiting translational motion.

File name- Supplementary Movie 3

File description- This movie shows the first 100 ns of dynamics for high-symmetry skyrmions exhibiting rotational motion.

File name- Supplementary Movie 4

File description- This movie shows the first 20 ns of dynamics for rotating skyrmion bags depicted in Fig. 4a.

File name- Supplementary Movie 5

File description- This movie shows the first 500 ns of complex rotation dynamics of the skyrmion bag depicted in Fig. 4b.

File name- Supplementary Movie 6

File description- This movie shows the first 500 ns of complex rotation dynamics of the skyrmion bag depicted in Fig. 4b and c for comparison.

File name- Supplementary Movie 7

File description- This movie illustrates skyrmion-skyrmion scattering process (the first 500 ns) for the three most representative cases where the target particle is i) π -skyrmion ($Q = -1$), ii) skyrmionium ($Q = 0$), and iii) skyrmion bag ($Q = 2$).

File name- Supplementary Software 1

File description- The script contains the example of Mumax code used to simulate the scattering of the chiral droplet on the π -skyrmion. The implementation of the fourth-order finite difference scheme is provided.