

Movie S1. Evolution of reflected polarization ellipses for 7 wavelengths (1438.5 nm to 1441.5 nm in steps of 0.5 nm) as a function of applied voltage (0 V to 40 V), corresponding to electron doping. The ellipses change transparency (highly transparent to highly opaque) with increasing voltage for better visualization. Ellipses with solid lines denote left handedness, whereas the ones with dashed lines denote right handedness. The measurement corresponds to the spatial point discussed in Fig. 4.

Movie S2. Evolution of reflected polarization ellipses for 7 wavelengths (1441 nm to 1444 nm in steps of 0.5 nm) as a function of applied voltage (0 V to -40 V), corresponding to hole doping. The ellipses change transparency (highly transparent to highly opaque) with increasing voltage for better visualization. Ellipses with solid lines denote left handedness, whereas the ones with dashed lines denote right handedness. The measurement corresponds to the spatial point discussed in Fig. 4.

Movie S3. Evolution of spectral trajectory on the normalized Poincaré sphere as a function of applied voltage. The trajectories are shown between 1430 nm and 1450 nm in steps of 0.5 nm. Voltage tuning is shown from 10 V to 30 V in steps of 2.5 V. The measurement corresponds to the spatial point discussed in Fig. 4.

Movie S4. Evolution of spectral trajectory on the normalized Poincaré sphere as a function of applied voltage. The trajectories are shown between 1430 nm and 1450 nm in steps of 0.5 nm. Voltage tuning is shown from -10 V to -30 V in steps of 2.5 V. The measurement corresponds to the spatial point discussed in Fig. 4.