Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information to *Active magnetoplasmonic split-ring/ring nanoantennas*

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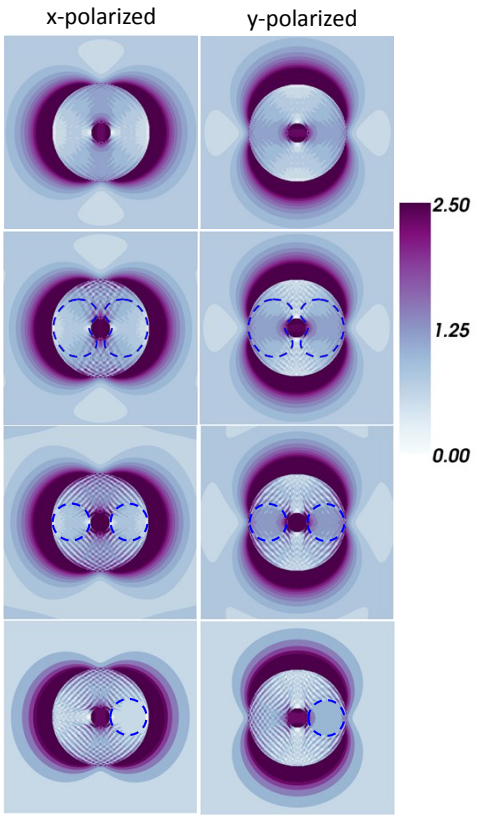

Fig. S1 Electric field magnitude distribution in the central plane of Co inclusion layer for the Co 1 dot, 2 dots, 2 sectors and continuous Co ring structures, obtained from the DDA simulation for the LE extinction peaks in Fig. 3(b) and for x-polarized light (E_x, left) and y-polarized light (E_y, right). The standing-wave-like distribution of the field intensity is due to the discretization of the dipoles in the simulation. The dashed blue lines correspond to the positions of the Co dot, dots and sectors. (For the structure containing a Co continuous ring, the field maps are the same one, but rotated for easy comparison with the other structures.)

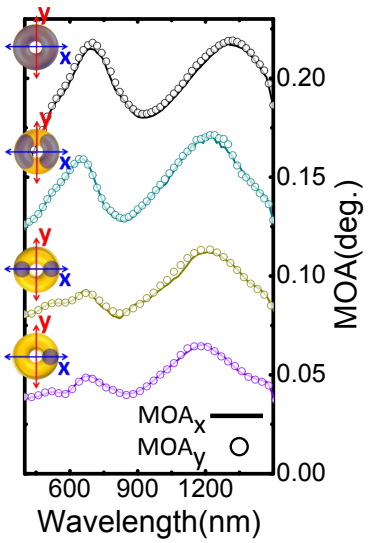

Fig. S2 Magneto Optical Activity (MOA) for the Co 1 dot, 2 dots, 2 sectors and Co continuous ring structures for both x- and y-polarized light. Spectra are shifted upwards for better clarity by 0.03°, 0.07°, 0.105°, and 0.11° from Co 1 dot to Co continuous ring structure, respectively. Two enhanced peaks are observed in LE and HE ranges in all the spectra, implying the plasmon enhanced MO effect in these spectral ranges.

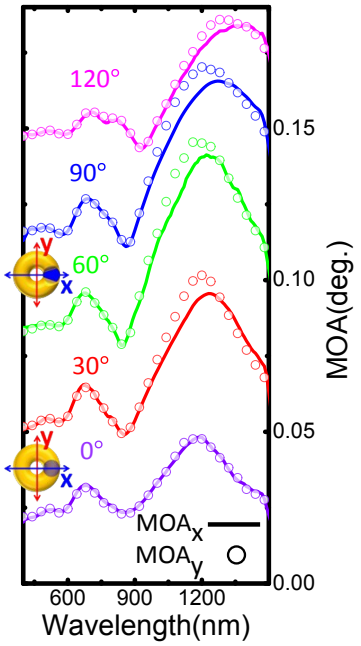

Fig. S3 Magneto Optical Activity (MOA) for the series of gapped structures with different gap openings. Spectra are shifted upwards for better clarity by 0.013°, 0.04°, 0.075°, 0.108°, and 0.14° from 0° gap sample to 120° gap one, respectively. Obviously the MO effect in the LE range obtains its maximum for the structure with 60° gap.

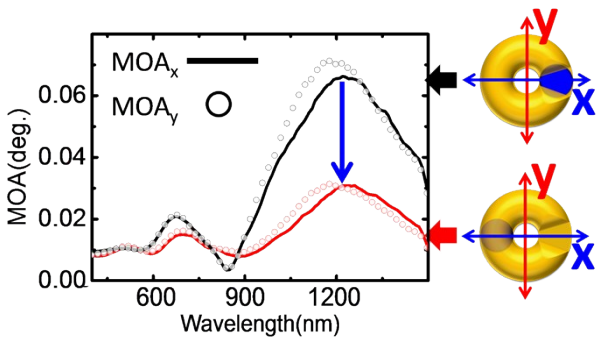

Fig. S4 Further experiment to confirm gap-enhanced MO activity. By positioning the Co dot in the opposite position (red line and circles) rather than the gap region (black line and circles), the MOA reduces immediately to less than a half since the further localized EM field is not in the Co region. Both of the structures have gaps of 60° angle.