Supplemental Document

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Separating and trapping of chiral nanoparticles with dielectric photonic crystal slabs: supplement

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Supplementary materials for

“Separating and trapping of chiral nanoparticles with dielectric photonic crystal slabs”

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To further understand the PhC slab with different Bloch modes, Fig. S1 shows the distributions of electric and magnetic fields in the unit cell of the PhC slab under the excitation of circularly polarized light (CPL). From the main text, we know that the PhC slab with t = 326.2 nm has a quasi-fourfold degenerate mode, and the excitation wavelength is 719.8 nm. And the PhC slab with t = 280 nm has double degenerate TM-like and TE-like modes. The excitation wavelengths of double degenerate TM-like and TE-like modes are 705.2 nm and 710.3 nm respectively. Comparing the distributions of electric and magnetic fields under the three excited Bloch modes in Fig. S1, it is obvious that the intensity of electric and magnetic fields with the PhC slab sustaining quasi-fourfold degenerate mode is much larger than that with separated double degenerate TE-like and TM-like modes. Besides, the electric field intensity of the PhC slab with double degenerate TM-like mode is larger than double degenerate TE-like mode, as shown in Fig. S1(a). And the magnetic field intensity of the PhC slab with double degenerate TM-like mode is smaller than double degenerate TE-like mode, as shown in Fig. S1(b). The results here are consistent with the results in Fig. 1 of the main text.

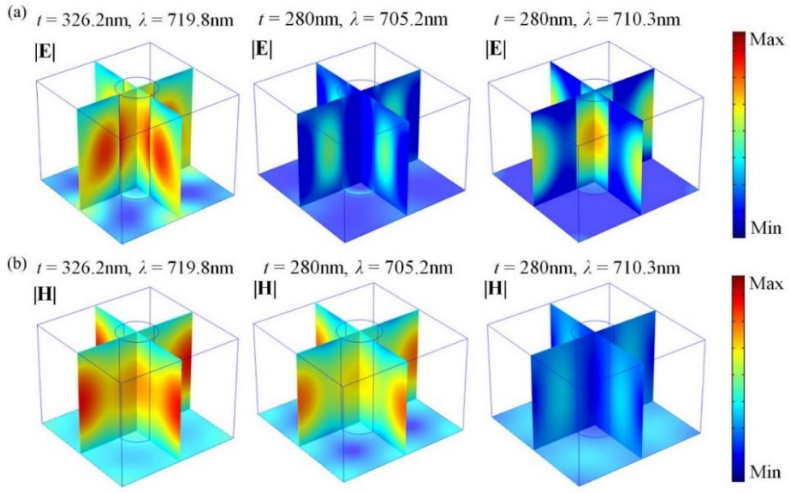

Fig. S1. The distributions of electric and magnetic fields in the unit cell of PhC slab under the excitation of CPL. (a) Electric field distributions at the excited quasi-fourfold degenerate mode (t = 326.2 nm, λ = 719.8 nm), double degenerate TM-like mode (t = 280 nm, λ = 705.2 nm) and double degenerate TM-like mode (t = 280 nm, λ = 710.3 nm) respectively. (b) Magnetic field distributions at the excited quasi-fourfold degenerate mode (t = 326.2 nm, λ = 719.8 nm), double degenerate TM-like mode (t = 280 nm, λ = 705.2 nm) and double degenerate TM-like mode (t = 280 nm, λ = 710.3 nm) respectively.