

Supplementary Information

Transparent projection screen based on plasmonic Ag nanocubes

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Experimental

Synthesis of Ag nanocubes: Ag nanocubes were synthesized as follows. Ethylene glycol (5 mL) was stirred at 140-145 °C in a 20 mL capped vial for 1 h, followed by addition of 3 mM HCl in ethylene glycol (1 mL). After stirring in the capped vial for 10 min, 94 mM AgNO₃ in ethylene glycol (3 mL) and 147 mM poly(vinylpyrrolidone) (monomer unit, *Mr* ~ 55000) in ethylene glycol (3 mL) were added simultaneously to the stirred solution at 45 mL h⁻¹, followed by stirring in the capped vial at 140-145 °C for about 2 h. The nanocubes were precipitated by addition of excess acetone, separated by centrifugation at 2000g and resuspended in ethanol.

Table S1. Extinction cross section of a 100 nm Ag nanocube on a 40, 110, or 160 nm thick TiO₂ film and electric field intensity in the distal or proximal region for a TiO₂ film without Ag nanocube calculated by an FDTD method.

TiO ₂ thickness [nm]	Distal region ^a		Proximal region ^b	
	Extinction ^c	<i>E</i> ^{2 c}	Extinction ^c	<i>E</i> ^{2 c}
40	1.00	1.00	1.00	1.00
110	0.86	0.88	2.56	3.00
160	0.65	0.73	0.93	2.42

^a72-102 nm away from the TiO₂ surface.

^b2-32 nm away from the TiO₂ surface.

^cNormalized at the 40 nm thick TiO₂.

Table S2. Viewing angle dependence of the backward scattering in the case of a 100 nm Ag nanocube on a 110 nm thick TiO₂ film.

Viewing angle [degree]	Scattering(455 nm)/Scattering(636 nm)
0 ^a	3.0
15	2.7
30	1.9

^aNormal to the substrate.