Supporting Information

Direct Visualization of Counter-Propagating Surface Plasmons in Real Space-Time

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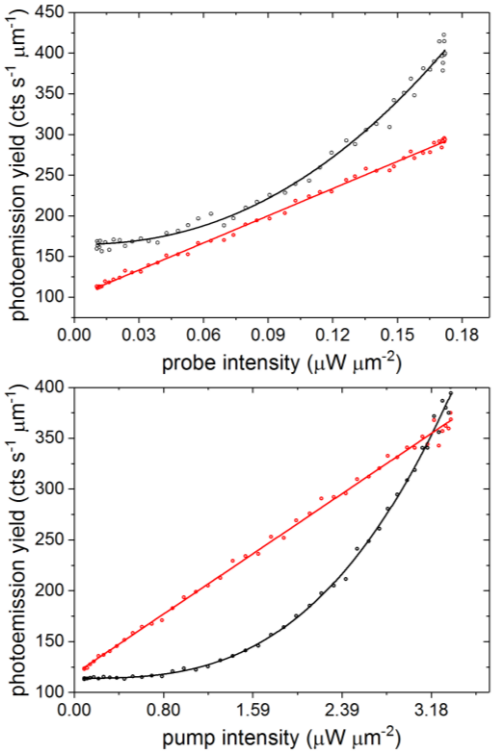

Figure S1. Power dependence measurements recorded by varying the probe (395 nm, top) and pump (790 nm, bottom) intensities. The black traces were acquired by spatially integrating the 2PG response (15x15, 400 nm pitch) while the red traces were acquired on the isolated SPP, outside the pump-probe cross-correlation region. The pump intensity dependence is 3rd (I^3) order on the array and linear with respect to the SPP. Similarly, we observe a probe linear power dependence for the SPP only. On the 2PG, the pump exhibits an $I^{2.2}$ power dependence, indicating a finite probability that two 790 nm photons contribute to the response.

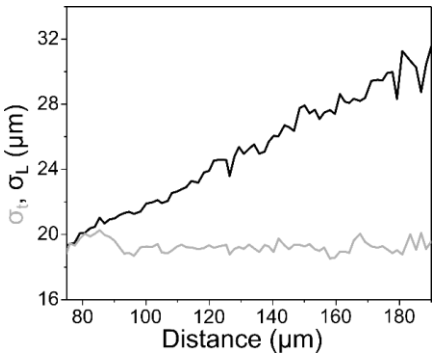

Figure S2. SPP widths recorded as a function of propagation distance for the lateral (σ_L, black trace) and transverse (σ_t, gray trace) directions extracted from 2D Gaussian fits of the SPP trajectory outside the pump-probe cross-correlation (~75 µm). While the transverse width is a constant dictated primarily by the probe pulse duration, the lateral spreading yields the SPP divergence angle, $\delta = 5.7°$.