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Experimental Confirmation of Backscattering Enhancement Induced by a Photonic Jet.[1] ALEXANDER HEIFETZ, KEVIN HUANG, ALAN SAHAKIAN, XU LI, ALLEN TAFLOVE, VADIM BACKMAN, Northwestern University — We report experimental confirmation of backscattering enhancement induced by a photonic jet emerging from a dielectric sphere, a phenomenon recently predicted by theoretical solutions of Maxwell's equations. To permit relatively straightforward laboratory measurements at microwave frequencies rather than visible light, we appropriately scaled the original conceptual dimensions of the dielectric microsphere and its adjacent perturbing nanoparticle (located within the microsphere's photonic jet). Our experiments verified the existence of enhanced position-dependent backscattering perturbations by the adjacent particle. Our measured backscattering perturbations agreed well with prior theory and with additional finite-difference time-domain computational models of the complete microwave test geometry.

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Alexander Heifetz
Northwestern University

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