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Intersection of two nanotubes: density of states modulated by plasmon beatings with period governed by Luttinger-liquid parameter[1]

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— We study theoretically the plasmon scattering at the intersection of two metallic carbon nanotubes. We demonstrate that for a small angle of crossing, $\theta \ll 1$, the transmission coefficient is an *oscillatory* function of λ/θ, where λ is the interaction parameter of the Luttinger liquid in an individual nanotube. We calculate the tunnel density of states, $\nu(\omega, x)$, as a function of energy, ω, and distance, x, from the intersection. In contrast to a single nanotube, we find that, in the geometry of crossed nanotubes, conventional "rapid" oscillations in $\nu(\omega, x)$ due to the plasmon scattering acquire an aperiodic "slow-breathing" envelope which has λ/θ nodes.

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