

Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Collinear Four-Photon Scattering of Mildly Intense Laser Pulses in Tenuous Plasma¹ VLADIMIR MALKIN, NATHANIEL FISCH, Princeton University — Collinear, planar electromagnetic waves of small amplitudes cannot satisfy exact synchronism conditions for four-photon resonance in plasma. However, in tenuous plasma, even a mildly relativistic electron nonlinearity, exceeding a very small threshold, enables the collinear four-photon scattering. The width of the frequency domain in which the exact four-photon resonance is allowed increases with the laser intensities. At yet very small relativistic electron nonlinearity, this width significantly exceeds the tenuous electron plasma frequency. Being far enough from the Raman resonances, the newly found four-photon scattering process becomes insensitive to plasma inhomogeneities, and so may persist even if Raman scattering is suppressed by variations in the electron plasma concentration.

¹NNSA Grant No. DENA0003871 and AFOSR Grant No. FA9550-15-1-0391.

Nathaniel Fisch
Princeton University

Date submitted: 29 Jun 2020

Electronic form version 1.4