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Photon acceleration by co-propagating plasma waves RAOUL TRINES, C. MURPHY, R. BINGHAM, CCLRC Rutherford Appleton Laboratory, UK, J.T. MENDONCA, L.O. SILVA, Instituto Superior Tecnico, Lisbon, Portugal, A. REITSMA, Strathclyde University, Glasgow, UK, P. NORREYS, CCLRC Rutherford Appleton Laboratory, UK — We have studied photon acceleration of an intense laser pulse interacting with co-propagating plasma waves. This type of photon acceleration has several characteristics that distinguish it from blueshift induced by ionization fronts: an asymmetric redshift/ blueshift around the central frequency, a decrease in the intensity of the blueshifted light with increasing plasma density, and a split fundamental peak in the spectrum. Photon kinetic simulations reveal how these characteristics arise from the interplay between the laser pulse and the plasma wave. The results have important implications for laser-plasma accelerators.

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