Title:	Atomic and molecular systems driven by intense random light
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Abstract:	We investigate dynamics of atomic and molecular systems exposed to intense, shaped random fields and a weak femtosecond laser pulse theoretically. As a prototype example, the photoionization of a hydrogen atom is considered in detail. The net photoionization undergoes an optimal enhancement when a broadband random field is added to the weak laser pulse. The enhanced ionization is analyzed using time-resolved wavepacket evolution and the population dynamics of the atomic levels. We elucidate the enhancement produced by spectrally shaped random fields of two different classes, one with a tunable bandwidth and another with a narrow bandwidth centered at the first atomic transition. Motivated by the large bandwidth provided in the high harmonic generation, we also demonstrate the enhancement effect exploiting random fields synthesized from discrete, phase randomized, odd-order and all-order high harmonics of the driving pulse. These findings are generic and can have applications to other atomic and simple molecular systems.
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