Title:	Control of molecular breakup by an infrared pulse and a femtosecond pulse train
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Abstract:	We investigate the dissociation dynamics of diatomic molecules subjected to both a femtosecond infrared (IR) laser pulse and a femtosecond pulse train (FPT) within the framework of the Morse potential model. When the IR and FPT are phase delayed, we observe well-resolved oscillations in dissociation probability, corresponding to multiple integers of the IR period, exhibiting enhancement and suppression of bond dissociation. These oscillations reveal a rich dynamics as a function of the IR and FPT parameters including chaotic fields. A frequency-resolved profile of dressed molecular states shows that these oscillations are due to interference of many quantum paths analogous to the recently observed control of photoionization of atoms under IR and XUV pulses. By manipulating phases of FPTs we demonstrate an enhancement of molecular dissociation compared to the transform-limited case.
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