



Controlled absorption and all-optical diode action due to collisions of self-induced transparency solitons

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We study inelastic collisions of counter-propagating self-induced transparency solitons in a homogeneously broadened two-level medium. The energy of the pulse can be almost totally absorbed in the medium due to asymmetric collision with a properly chosen control pulse. The medium state thus prepared demonstrates the property of an all-optical diode which transmits pulses from one direction and blocks from another. The saturation process of a controlled absorption effect, local-field correction influence, and the parameter ranges for the diode action are studied as well.

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