

Switching of discrete optical solitons in engineered waveguide arrays

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An effective method for controlling nonlinear switching of discrete solitons in arrays of weakly coupled optical waveguides was discussed. The key ideas of the array engineering by means of a steplike variation of the waveguide coupling was demonstrated which was based on the effective discrete nonlinear equations describing light propagation in the waveguide arrays in the tight-binding approximation. The discrete model was used to estimate the Peierls-Nabarro (PN) potential experienced by a strongly localized nonlinear mode that was kicked initially in a cubic nonlinear waveguide array. The result suggests a possible control mechanism for the switching of strongly localized excitations by means of a steplike variation of the waveguide coupling.