Quantization of binding energy of structural solitons in passive mode-locked fiber lasers

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Résumé en anglais	On basis of numerical simulation of fiber laser passive mode locking, we have determined the quantum binding-energy levels for a pair of interacting structural solitons. These solitons have powerful wings and correspondingly large binding energies. It has been found that the field amplitude functions for steady states corresponding to neighboring energy levels have opposite parity. We have pointed out the analogy between the energy quantization for laser bound solitons and for a particle moving in potential well. The possibility of a coexistence of in-, opposite-, and π/2-phase soliton pairs has been found. In the case of multiple soliton trains, we have demonstrated the realization of highly stable soliton sequences with any required distribution along the soliton train of various types of bonds between neighboring pulses.
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