Models for optical solitons in the two-cycle regime

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Résumé en anglais	We derive model equations for optical pulse propagation in a medium described by a two-level Hamiltonian, without the use of the slowly varying envelope approximation. Assuming that the resonance frequency of the two-level atoms is either well above or well below the inverse of the characteristic duration of the pulse, we reduce the propagation problem to a modified Korteweg–de Vries or a sine-Gordon equation. We exhibit analytical solutions of these equations which are rather close in shape and spectrum to pulses in the two-cycle regime produced experimentally, which shows that soliton-type propagation of the latter can be envisaged.
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[1] http://okina.univ-angers.fr/herve.leblond/publications
[2] http://okina.univ-angers.fr/francois.sanchez/publications
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