



# Analysis of soliton pattern formation in passively mode-locked fiber lasers

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| Résumé en anglais     | We give a detailed theoretical analysis of spontaneous periodic pattern formation in fiber lasers. The pattern consists of a bound state of hundreds of pulses in a ring fiber laser passively mode locked by nonlinear rotation of the polarization. The phenomenon is described theoretically using a multiscale approach to the gain dynamics: the fast evolution of a small excess of gain is responsible for the stabilization of a periodic pattern, while the slow evolution of the mean value of gain explains the finite length of the quasiperiodic soliton train. The resulting model is well adapted to experimental observations in a Er:Yb-doped double-clad fiber laser. |
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- [1] [http://okina.univ-angers.fr/publications?f\[author\]=8564](http://okina.univ-angers.fr/publications?f[author]=8564)
- [2] <http://okina.univ-angers.fr/herve.leblond/publications>
- [3] <http://okina.univ-angers.fr/m.salhi/publications>
- [4] [http://okina.univ-angers.fr/publications?f\[author\]=8560](http://okina.univ-angers.fr/publications?f[author]=8560)
- [5] <http://okina.univ-angers.fr/francois.sanchez/publications>
- [6] <http://okina.univ-angers.fr/publications/ua5150>
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