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**Curtis R Menyuk\*** ([menyuk@umbc.edu](mailto:menyuk@umbc.edu)), CSEE Dept., 1000 Hilltop Circle, Baltimore, MD 21250, and **Shaokang Wang** ([swan1@umbc.edu](mailto:swan1@umbc.edu)), CSEE Dept., 1000 Hilltop Circle, Baltimore, MD 21250. *Boundary tracking algorithms for determining the stability of modelocked lasers.*

Modelocked laser pulses can be studied as equilibria of a infinite-dimensional nonlinear dynamical system, whose linear stability can be determined by examining the spectrum of the perturbed system. Despite the importance of modelocked lasers, this approach has only be applied in idealized setting in which analytical solutions for the modelocked (equilibrium) solutions are known. Here, we describe boundary-tracking algorithms that allow us to apply this approach to realistic systems. (Received February 05, 2014)