Periodic Traveling Waves of the Short Pulse and Ostrovsky Equations: Existence and Stability

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We consider the Ostrovsky and short pulse models in a symmetric spatial interval, subject to periodic boundary conditions. We construct various periodic traveling wave solutions of the short pulse equation – a family of traveling peakons with corner crests, as well as classical traveling waves in terms of Jacobi elliptic functions. In both cases, we show spectral stability, for all values of the parameters. This is achieved by studying the non-standard eigenvalue problems in the form $\mathcal{L}[u] = \lambda u'$, where $\mathcal{L}$ is a Hill operator. This is a joint work with S. Hakkaev and A. Stefanov.