Mathematics > Numerical Analysis

Efficient numerical stability analysis of detonation waves in ZND

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(Submitted on 3 Nov 2010)

As described in the classic works of Lee--Stewart and Short--Stewart, the numerical evaluation of linear stability of planar detonation waves is a computationally intensive problem of considerable interest in applications. Reexamining this problem from a modern numerical Evans function point of view, we derive a new algorithm for their stability analysis, related to a much older method of Erpenbeck, that, while equally simple and easy to implement as the standard method introduced by Lee--Stewart, appears to be potentially faster and more stable.

Subjects: **Numerical Analysis (math.NA)**
Cite as: **arXiv:1011.0897v1 [math.NA]**

Submission history

From: Kevin Zumbrun [view email]
[v1] Wed, 3 Nov 2010 14:35:16 GMT (24kb)

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