Mathematics > Analysis of PDEs

# On the spectral properties of L_{+-} in three dimensions

Ovidiu Costin, Min Huang, Wilhelm Schlag

*(Submitted on 1 Jul 2011)*

This paper is part of the radial asymptotic stability analysis of the ground state soliton for either the cubic nonlinear Schrodinger or Klein-Gordon equations in three dimensions. We demonstrate by a rigorous method that the linearized scalar operators which arise in this setting, traditionally denoted by L_{+-}, satisfy the gap property, at least over the radial functions. This means that the interval (0,1] does not contain any eigenvalues of L_{+-} and that the threshold 1 is neither an eigenvalue nor a resonance. The gap property is required in order to prove scattering to the ground states for solutions starting on the center-stable manifold associated with these states. This paper therefore provides the final installment in the proof of this scattering property for the cubic Klein-Gordon and Schrodinger equations in the radial case, see the recent theory of Nakanishi and the third author, as well as the earlier work of the third author and Beceanu on NLS. The method developed here is quite general, and applicable to other spectral problems which arise in the theory of nonlinear equations.

| | |
|---|---|
| Subjects: | **Analysis of PDEs (math.AP)**; Mathematical Physics (math-ph) |
| MSC classes: | 35P15, 35P25 |
| Cite as: | **arXiv:1107.0323 [math.AP]** |
| | (or **arXiv:1107.0323v1 [math.AP]** for this version) |

## Submission history

From: Wilhelm Schlag [view email]
**[v1]** Fri, 1 Jul 2011 20:15:43 GMT (49kb)

*Which authors of this paper are endorsers?*