Stellingen

behorende bij het proefschrift

Oscillons

- It seems plausible that an oscillon in the quartic potential can radiate its asymmetry exponentially fast as both the even and odd multiples of the oscillation frequency are present in the spectrum. Due to the symmetry of the sine-Gordon potential the first radiative mode has stronger suppression, its frequency being three times the basic frequency - consequently deviations from radial symmetry decay more slowly.

  Chapter 3

- The suppression of the radiation losses of the oscillon in the potential $V(\phi) = \phi^2/\left(1+\phi^{2p}\right)$ is very strong. This raises the intriguing possibility that such an oscillon could go on indefinitely long.

  Chapter 4

- The velocity distribution of oscillons formed in a domain collapse extends to high Lorentz-factors. This leads us to speculate that oscillons are produced at cusps, regions of the domain wall traveling close to the speed of light.

  Chapter 5

- The capability of oscillons to cross domain walls and propagate from one vacuum to another demonstrates how surprisingly persistent objects they are.

  Chapter 5

- The strings in the Abelian-Higgs model can have the same principal features as expected from cosmic superstrings, namely formation of junctions and effective reconnection probability not strictly unity even at moderately low velocities.

  P. Salmi, *et al.*, Phys. Rev. **D 77** (2008)

- For many physical applications, the distinction between an infinite and a very long lifetime is irrelevant. As long as the object's lifetime is significantly larger than the natural timescales of the problem, it can have significant effects on the dynamics of the theory.

  E. Farhi, N. Graham, V. Khemani, R. Markov, and R.Rosales,
  Phys. Rev. **D 72** (2005)

- One of the most fascinating areas of inter-disciplinary research at the interface between mathematics and physics is the study of solitons. This word has as many definitions as there are people who study them, but in general terms they are stable, localized energy distributions.

  R. A. Battye and P. M. Sutcliffe, Nucl. Phys. **B 590** (2000)

- Nonlinear dynamics is rather unpredictable.

  E. W. Kolb and I. I. Tkatchev, Phys. Rev. **D 49** (1994)

- Magnetic Monopoles have not been observed, despite a long history of searching. Fortunately, the standard model of elementary particles has no monopole solutions.

  N. Manton and P. M. Sutcliffe, *Topological Solitons* (2004)

- Of course there is an enormous difference between finding a soliton-like solution to the field equations and finding solitons in the Universe. However, even if they are not found, the techniques developed for their study will be useful additions to the theorist's toolbox.

  E. W. Kolb and M. S. Turner, *The Early Universe* (1990)

- Dark Energy is the Pied Piper's pipe, luring astronomers away from their home territory to follow high-energy physicists down the path to professional extinction.

  S. D. M. White, Rep. Prog. Phys. **70** (2007)

- Hard work alone brings little progress.

  S. D. M. White, Rep. Prog. Phys. **70** (2007)

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