

Nonlinear Sciences > Pattern Formation and Solitons

Exact solutions of the modified Gross-Pitaevskii equation in 'smart' periodic potentials in the presence of external source

Thokala Soloman Raju, Prasanta K Panigrahi

(Submitted on 4 Dec 2009)

We report wide class of exact solutions of the modified Gross-Pitaevskii equation (GPE) in 'smart' Jacobi elliptic potentials: $V(\xi)=-V_0 \operatorname{sn}(\xi, m)$, $V(\xi)=-V_0 \operatorname{cn}(\xi, m)$, and $V(\xi)=-V_0 \operatorname{dn}(\xi, m)$ in the presence of external source. Solitonlike solutions, singular solutions, and periodic solutions are found using a recently developed fractional transform: $\rho(\xi)=\frac{A+Bf^2}{1+Df}$, where f is the respective Jacobi elliptic function and the amplitude parameters A , B , and D (it nonzero). These results generalize those contained in (Paul T, Richter K and Schlagheck P 2005 *Phys. Rev. Lett.* **94**, 020404) for nonzero trapping potential.

Comments: 8 pages, 2 figures

Subjects: **Pattern Formation and Solitons (nlin.PS)**Cite as: [arXiv:0912.0780v1](#) [nlin.PS]

Submission history

From: Prasanta K. Panigrahi [[view email](#)]

[v1] Fri, 4 Dec 2009 07:22:39 GMT (452kb)

*[Which authors of this paper are endorsers?](#)*Link back to: [arXiv](#), [form interface](#), [contact](#).

Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

nlin.PS

[< prev](#) | [next >](#)[new](#) | [recent](#) | [0912](#)

Change to browse by:

[nlin](#)

References & Citations

- [CiteBase](#)

Bookmark (what is this?)

 [CiteULike logo](#) [Connotea logo](#) [BibSonomy logo](#) [Mendeley logo](#) [Facebook logo](#) [del.icio.us logo](#) [Digg logo](#) [Reddit logo](#)