



**SELF-SIMILAR SOLUTIONS FOR A GENERALIZED
(3 + 1)-DIMENSIONAL GROSS-PITAEVSKII SYSTEM**

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Abstract

A general transformation solution for the generalized (3 + 1)-dimensional Gross-Pitaevskii equation with time-modulated dispersion, nonlinearity and potential is successfully derived with the aid of a direct self-similarity mapping approach. Base on the known exact solution of a self-similarity mapping equation, abundant periodic and localized excitations are revealed by entrancing appropriate system parameters. The integrable constraint conditions for the generalized (3 + 1)-dimensional Gross-Pitaevskii system derived naturally.

Keywords and phrases: Gross-Pitaevskii system, self-similarity mapping approach, self-similar solutions, periodic behaviors.

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