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**Higher-order analytical solutions for the equation of motion of a particle on a rotating parabola** (Conference Paper)

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## Abstract

In the present paper, a novel analytical technique to obtain higher-order approximate solutions for the equation of motion of a particle on a rotating parabola has been introduced, which is based on an energy balance method (EBM). The results are valid for small as well as large oscillation of initial amplitude. It is highly remarkable that using the introduced technique a third-order approximate solution gives an excellent agreement with the exact ones. The introduced technique is applied to the motion of a particle on a rotating parabola having high nonlinearity to illustrate its novelty, reliability and wider applicability. © 2017 Author(s).

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