

New Modified Jacobi Elliptic Function Expansion Method and Its Application to (3+1)-Dimensional KP Equation

DOU Fu-Quan, SUN Jian-An, DUAN Wen-Shan, SHI Yu-Ren, LÜ Ke-Pu, and HONG Xue-Ren

College of Physics and Electronics Engineering, Northwest Normal University, Lanzhou, 730070, China

(Received: 2005-9-20; Revised:)

Abstract: With the aid of computerized symbolic computation, the new modified Jacobi elliptic function expansion method for constructing exact periodic solutions of nonlinear mathematical physics equation is presented by a new general ansatz. The proposed method is more powerful than most of the existing methods. By use of the method, we not only can successfully recover the previously known formal solutions but also can construct new and more general formal solutions for some nonlinear evolution equations. We choose the (3+1)-dimensional Kadomtsev-Petviashvili equation to illustrate our method. As a result, twenty families of periodic solutions are obtained. Of course, more solitary wave solutions, shock wave solutions or triangular function formal solutions can be obtained at their limit condition.

PACS: 05.45.Yv

Key words: modified Jacobi elliptic function expansion method, KP equation, periodic solutions, solitary wave solutions

[\[Full text: PDF\]](#)

Close