论文

雅可比椭圆函数在大气和海洋动力学中的应用:二维非线性Rossby波研究

赵强,刘式适

北京大学物理学院大气科学系，北京 100871

摘要　提出了扩展雅可比椭圆函数方法，来求得Petviashvili方程的精确解析解.Petviashvili方程被视为正压准地转位涡度方程的非地转扩展，应用该方法可以得到很多二维非线性Rossby波的周期波解，在取极限情况下，也可以得到二维Rossby孤立子解.

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Application of Jacobi elliptic functions in the atmospheric and oceanic dynamics: studies on two　dimensional nonlinear Rossby waves

ZHAO Qiang, LIU Shi Kuo

Department of Atmospheric Sciences, School of Physics, Peking University, Beijing 100871, China

Abstract　The two　dimensional (2_D) nonlinear Rossby waves described by the Petviashvili equation, which has been invoked as an ageostrophic extension of the barotropic quasi　geostrophic potential vorticity equation, can be studied by the exact periodic　wave solutions for the Petviashvili equation. The exact analytical periodic　wave solutions to the Petviashvili equation are obtained by using our extended generalization of Jacobi elliptic function expansion method. It is shown that more periodic　wave 2_D Rossby solutions can be obtained by this method. In the limit case, the 2_D Rossby soliton solutions can also be obtained.

通讯作者:
 zhqing@pku.edu.cn
作者个人主页: 赵强;刘式适