Multisoliton Excitations for the Kadomtsev-Petviashvili Equation

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By means of the standard truncated Painlevé expansion and a special Bäcklund transformation, some exact multisoliton solutions are derived for the Kadomtsev-Petviashvili equation. The evolution properties of the multisoliton excitations are investigated and some novel features or interesting behaviors are revealed. The results show that four straight-line solitons are annihilated or produced with the time increases, which is very similar to the completely nonelastic collision among electrons and positrons.

Key words: Kadomtsev-Petviashvili Equation; Variable Separation Approach;
Bäcklund Transformation; Annihilation.