

Special decompositions and linear superpositions of nonlinear systems: BKP and dispersionless BKP equations

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Abstract

The existence of decomposition solutions of the well-known nonlinear BKP hierarchy is analyzed. It is shown that these decompositions provide simple and interesting relationships between classical integrable systems and the BKP hierarchy. Further, some special decomposition solutions display a rare property: they can be linearly superposed. With the emphasis on the case of the fifth BKP equation, the structure characteristic having linear superposition solutions is analyzed. Finally, we obtain similar superposed solutions in the dispersionless BKP hierarchy.

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