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Conformal Invariant Asymptotic Expansion Approach for Solving (3+1)-Dimensional JM Equation

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Abstract: The (3+1)-dimensional Jimbo-Miwa (JM) equation is solved approximately by using the conformal invariant asymptotic expansion approach presented by Ruan. By solving the new (3+1)-dimensional integrable models, which are conformal invariant and possess Painlevé property, the approximate solutions are obtained for the JM equation, containing not only one-soliton solutions but also periodic solutions and multi-soliton solutions. Some approximate solutions happen to be exact and some approximate solutions can become exact by choosing relations between the parameters properly.

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Key words: (3+1)-dimensional Jimbo-Miwa (JM) equation, conformal invariant asymptotic expansion approach, Painlevé property, approximate and exact solutions