Stefan-Type Moving Boundary Problems for the Dym Equation and its Reciprocals

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Abstract

Moving boundary problems of generalised Stefan-type are considered for the solitonic Harry Dym equation via a Painlevé II symmetry reduction. Exact solution of such nonlinear boundary value problems is obtained in terms of Yablonski-Vorob'ev polynomials corresponding to an infinite sequence of values of the Painlevé II parameter. The action of two kinds of reciprocal transformation on the class of moving boundary problems is described.