



# The Kadomtsev-Petviashvili I Equation on the Half-Plane

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A new method for the solution of initial-boundary value problems for \textit{linear} and \textit{integrable nonlinear} evolution PDEs in one spatial dimension was introduced by one of the authors in 1997 \cite{F1997}. This approach was subsequently extended to initial-boundary value problems for evolution PDEs in two spatial dimensions, first in the case of linear PDEs \cite{F2002b} and, more recently, in the case of integrable nonlinear PDEs, for the Davey-Stewartson and the Kadomtsev-Petviashvili II equations on the half-plane (see \cite{FDS2009} and \cite{MF2011} respectively). In this work, we study the analogous problem for the Kadomtsev-Petviashvili I equation; in particular, through the simultaneous spectral analysis of the associated Lax pair via a  $\bar{d}$ -bar formalism, we are able to obtain an integral representation for the solution, which involves certain transforms of all the initial and the boundary values, as well as an identity, the so-called global relation, which relates these transforms in appropriate regions of the complex spectral plane.

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