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Alicia Machuca*, amachuca@twu.edu. *A Method for Explicit Solution Formulas for Integrable Evolution Equations in 2+1 Dimensions.*

A systematic method is developed to obtain solution formulas for certain explicit solutions to integrable nonlinear partial differential equations in two spatial variables and one time variable. The method utilizes an underlying Marchenko integral equation that arises in the corresponding inverse scattering problem. The method is demonstrated for the Kadomtsev-Petviashvili and the Davey-Stewartson equations. Such solution formulas are expressed in a compact form in terms of matrix exponentials, by using a set of four constant matrices as input. The formulas hold for any sizes of the matrix quadruplets and hence yield a large class of explicit solutions. (Received September 24, 2017)