

The method of particular solutions for the Helmholtz equation

**G.E. Sneddon, W.R. Read*

James Cook University, Townsville, Australia

In a previous paper, we showed that steady hillslope seepage problem can be reduced to the solution of the Helmholtz equation in two dimensions. Solutions were initially found by using an analytic series method (or the method of particular solutions). However, the accuracy of these solutions was limited by ill-conditioning in the set of basis functions as the number of basis functions increased. In this paper, we show that these problems can be overcome by choosing a different set of basis functions and modifying the method of particular solutions as suggested by Trefethen. In this case, the equation can be solved on a number of simple geometric shapes with spectral convergence in the value of the eigenvalue.