A GENETIC ALGORITHM APPROACH FOR INVESTIGATING THE FREE-BOUNDARY SEEPAGE FROM A SYMMETRIC SOIL CHANNEL WITH AN ANGULAR POINT

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ABSTRACT

We present an original method to investigate the two-dimensional free-boundary seepage from symmetric soil channels with an angular point. We use Levi-Civita's function to construct the integral representations for the coordinates of the points from the channel boundary. A genetic algorithm is used to calculate the coefficients of the Maclaurin series expansion of the non-singular part of Levi-Civita's function. In order to define the objective function we impose to the coordinates calculated by means of the integral representations to satisfy the equation of the boundary of the channel. Levi-Civita's function is afterwards used to calculate the seepage loss, the free lines and the velocity field. Some examples illustrate the method.