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Two-dimensional irrotational nonlinear flow over arbitrary bottom topography in a Channel SRIKUMAR PANDA, SUBASH CHANDRA MARTHA, Indian Institute of Technology Ropar, India, ALOKNATH CHAKRABARTI, Indian Institute of Science, Bangalore, India — The problem involving two-dimensional irrotational flow over arbitrary bottom topography in an infinite channel is investigated within the framework of fully nonlinear theory. This two-dimensional problem can be cast into a mixed boundary value problem. Using certain transformations, the mixed boundary value problem is formulated as a Dirichlet problem. The Dirichlet problem is solved by the aid of integral equation method, and the solution of the Dirichlet problem involves an unknown potential function that is to be determined. This unknown function can be determined completely, once a pair of singular integral equations appearing here are solved completely. By the help of Newton's method, the free surface profile is determined and shown graphically.

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