Local controllability of a 1-D tank containing a fluid modeled by the shallow water equation.

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We consider a 1-D tank containing an incompressible inviscid irrotational fluid. The tank is subject to the control which consists of horizontal moves. The motion of the fluid is described by the shallow water equation. Using the return method, we prove the large time local controllability around the rest configuration. This local controllability is given by the nonlinear terms: it has been proved by F. Dubois, N. Petit and P. Rouchon that the linearized control system around the rest configuration is not controllable.