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Direct numerical simulation of the boundary layer induced by surface gravity waves

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A great simplification of the equation of motion for surface gravity waves comes from the assumptions that waves are irrotational and viscosity is not relevant. However, recently it has been established that for some applications vorticity may play an important role.
In order to study the problem we have developed a numerical code for solving the Navier Stokes equations for the water wave problem. In particular we present some preliminary results on the boundary layer structure induced by the waves.