

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Initial development of a corner wave¹ PABLO MARTINEZ-LEGAZPI, JAVIER RODRIGUEZ-RODRIGUEZ, Carlos III University of Madrid, JUAN LASHERAS, University of California, San Diego — We have studied the flow downstream the corner of a partially submerged vertical plate using a combination of experimental, numerical and analytical tools. In this flow configuration, a steady wave remains attached to the corner of the plate. Both the amplitude and slope of the wave front increase with the downstream distance until the wave breaks resulting in either a spilling or a plunging breaker. This simple laboratory set-up can be used to gain a better understanding on how waves break in other configurations of interest in oceanography or naval hydrodynamics. In particular, the effect of two dimensionless parameters on the breaking process is explored: (1) a Froude number based on the height of the free surface above the plate corner and (2) the dimensionless curvature of this corner. It will be shown that, properly re-scaling the trajectory of the corner wave front with the above mentioned parameters, it follows a universal curve during the first instants of the formation process.

¹Supported by the ONR through grant N00014-05-1-0121.

Javier Rodriguez-Rodriguez
Carlos III University of Madrid

Date submitted: 30 Jul 2010

Electronic form version 1.4