



Universidad
Carlos III de Madrid

Seminario del Instituto Gregorio Millán

Unsteady characteristics of a shallow porous cylinder wake.

Dr. W. Brevis

(Sheffield Fluid Mechanics Group - Dept. of Civil and Structural Eng.,
University of Sheffield)
w.brevis@sheffield.ac.uk

F. Nicolleau

(Sheffield Fluid Mechanics Group - Dept of Mech. Eng, University of Sheffield)
F.Nicolleau@Sheffield.ac.uk

N. M. Sangtani Lakhwani

(Sheffield Fluid Mechanics Group - Dept of Mech. Eng, University of Sheffield)
NMSangtaniLakhwani1@sheffield.ac.uk

Abstract

In this work the result of laboratory flow visualisations and Large Scale Particle Image Velocimetry measurements of the wake developed after three emerged square arrays of rigid cylinders in a shallow water flow are presented. It is observed that for all cases a steady wake is developed downstream the array and it is followed by a vortex street pattern. It is shown that not always higher porosities produce a more extended steady wake and reduced turbulent intensities. It is also shown that in two cases the dominant wake frequency remain constant, and indication that the solid volume fractions do not affect the wake frequency. It is also observed that this frequency was also present within the slow steady wake in one of the measured cases, which could be evidence of an instability initiated within the cylinder array.

Based on a Dynamic Mode Decomposition and Wavelet analysis of two and one-dimensional time series a description of the dominant coherent structures in the near and far field is presented. A discussion regarding the use of fractal arrays will be also presented.

Día y hora: Miércoles, 27 de febrero de 2013 a las 12:30 horas

Lugar: Sala 7.1.H01 (Edificio Juan Benet, ala H), Universidad Carlos III