Asociación Argentina
de Mecánica Computacional

Mecánica Computacional Vol XXXVIII, págs. 961-961 (resumen)
H.G. Castro, J.L. Mroginski, R.R. Paz, M.A. Storti (Eds.)
Resistencia, 1-5 Noviembre 2021

APPLICATION OF SECOND ORDER RANS TURBULENCE MODELING FOR THE NUMERICAL SIMULATION OF WIND FLOW OVER A STORAGE TANK

Juan P. Saldía[a], Sergio A. Elaskar[a,b], Luis F. Gutiérrez Marcantoni[a,c] and Pascal Bruel[d]

[a]*Departamento de Aeronáutica, Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba, jsaldia@unc.edu.ar*

[b]*Instituto de Estudios Avanzados en Ingeniería y Tecnología, IDIT-UNC-CONICET, idit@fcefyn.unc.edu.ar; http://www.inv.idit.efn.uncor.edu*

[c]*Universidad Católica de Córdoba, Facultad de Ingeniería, Av. Armada Argentina 3555, Córdoba, Argentina*

[d]*CNRS - University Pau Pays Adour, LMAP - Inria CAGIRE Team, Av. de l'Université, 64013 Pau, Francia*

Keywords: Second-moment closure, wind, turbulent flow, tanks.

Abstract. In this work, we consider the numerical modeling of the turbulent separated flow over a tank immersed in the Atmospheric Boundary Layer (ABL). A second-moment Elliptic Blending Reynolds Stress Model (EB-RSM) is employed for the numerical computation of mean pressure distributions over an isolated cylindrical storage tank. Numerical results are compared with those obtained through linear eddy viscosity models where isotropy of Reynolds stresses is assumed. The assessment of the numerical methodology is completed through the comparison with experimental results obtained in an ABL wind tunnel where different flow and geometrical conditions representative of oil storage tanks exposed to atmospheric winds are considered.