Asociación Argentina
de Mecánica Computacional

Mecánica Computacional Vol XL, págs. 1079-1079 (resumen)
F.A. Avid, L.C. Bessone, P. Gamazo, J.J. Penco, M.A. Pucheta, M.A. Storti (Eds.)
Concordia, 6-9 Noviembre 2023

NUMERICAL AND EXPERIMENTAL ASSESSMENT OF DELTA-WING VORTEX GENERATORS AS PASSIVE DEVICES TO COOL RADIATORS IN NATURAL CONVECTION

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Keywords: Radiators, natural convection, thermo-fluid dynamic simulations, experimental facility, delta-wing vortex generators.

Abstract. This work presents both experimental and numerical efforts in order to assess the thermal performance of delta-wing vortex generators to increase the cooling in radiators which are working in natural convection. A test facility was developed to evaluate different vortex generators configurations and to measure the cooling increase on the panel surface due to them. These measurements are realized with k-type thermocouples and a FLIR camera, while the air flow velocity and temperature fields are measured with a hot wire anemometer. On the other hand, the thermo-fluid dynamic numerical simulations are carried out with multiphysics code Code_Saturne for the specific configurations analyzed in this test facility. Several parameters are taken into account, like the angle of attack, the clearance distance to the panel surface and the distance between vortex generator arrays. The numerical simulations allow to compute local and global heat transfer enhancements from the panel to the air.

Acknowledgements: the authors acknowledges to CAI+D 2020-50620190100140LI, CAI+D 2020-50620190100110LI, PICT-2021-I-A-00582, PICT-2021-I-A-00651,