COMPUTATIONAL SIMULATION OF A DOUBLE-DECK BUS DYNAMICS IN A BEND TURNING COUPLED WITH CROSSWIND EFFECTS

Hugo G. Castro[a,b,c], **Marcelo I. Adotti**[a,c], **Julián Medina**[a,c], **Rodrigo R. Paz**[d,a,c], **Facundo Del Pin**[d] **and Iñaki Caldichouri**[d]

[a]*Laboratorio de Mecánica Computacional (LaMeC), Facultad de Ingeniería de la Universidad Nacional del Nordeste (UNNE), Av. Las Heras 727, 3500 Resistencia, Chaco, Argentina, guillermo.castro@conicet.gov.ar,
http://www.imit-conicet.gob.ar/laboratorio-de-mecanica-computacional*

[b]*Grupo de Investigación en Mecánica de Fluidos (GIMeF), Facultad Regional Resistencia de la Universidad Tecnológica Nacional (UTN), French 414, 3500 Resistencia, Chaco, Argentina.*

[c]*Instituto de Modelado e Innovación Tecnológica (IMIT), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Av. Libertad 5460, W3404AAS Corrientes, Argentina.*

[d]*Livermore Software Technology Corporation (LSTC), Las Positas Road 7374, 94551 Livermore, California, USA.*

Keywords: High-sided road vehicles, Crosswind, Computational Fluid Dynamics, Open-FOAM.

Abstract. Stability of high-sided road vehicles (trucks, vans, double-deck buses, etc) is highly influenced by crosswinds. Double-deck buses have an increased demand in some countries of Latin America due to their large passenger transportation capability. The variable conditions of the roads and mass distribution of the bus, i.e. vehicle with all passengers in the lower/upper level, empty or full, coupled with the wind action acting on it may lead to dangerous situations. To further understand this subject, a computational fluid dynamics (CFD) simulation of a double-deck bus taking a bend road coupled with crosswind is performed in this work. Some comments about the open source CFD toolbox OpenFOAM implementation to reproduce some dynamics characteristics of the rollover instability are made.