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Methods in Engineering
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Numéricos em Engenharia
Congreso de Métodos
Numéricos en Ingeniería

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Universidade do Minho
Escola de Engenharia



Universidade do Minho
Escola de Ciências

APM|AC SEMNI

Congress on Numerical Methods in Engineering

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Numéricos em Engenharia

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Numéricos en Ingeniería

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Preface

CMN 2019 aims to be a forum for the discussion of relevant scientific, and technological developments in computational mechanics, numerical methods and engineering applications. CMN 2019 is jointly organized by the Portuguese (APMTAC) and the Spanish (SEMNI) Associations and follows the previous congress editions of Madrid (2002), Lisbon (2004), Granada (2005), Porto (2007), Barcelona (2009), Coimbra (2011), Bilbao (2013), Lisbon (2015) and Valencia (2017).

The scientific program comprises six plenary lectures from internationally known researchers and is structured in almost 30 thematic sessions in different fields of research. We sincerely thank the session organizers for their contribution for the success of the congress.

The congress is open to everyone interested in numerical methods and the objective of the series is to create an excellent forum for dissemination of the latest scientific and technical developments and for the exchange of new ideas in emerging topics. We hope this can be achieved and the participants enjoy the technical and social program planned, together with the welcoming and UNESCO World Heritage city of Guimarães.

More than 275 participants from 30 countries are expected making CMN 2019 a truly international event. We are happy to share with you an exciting program composed of almost 300 contributions concerning a wide range of activities and research fields in numerical methods. The series of conferences benefits immensely from joining young participants (and the future of our community) with more senior academics and professionals, with a very attractive conference fee for young participants. Young participants totalize 40% of the participants, which is to be noted.

Thinking about the young participants, a unique presentation possibility is offered with oral (more formal and less interactive) and poster (informal and interactive) presentations of the same paper. We are also happy that three post-congress advanced software courses are offered to all participants, again at a modest fee, which total more than 50 participants.

We warmly thank the contributors, the authors, the speakers and the exhibitors of the event and wish this conference will offer you fruitful discussions and a pleasant time in Guimarães.

Guimarães, July 2019

Paulo B. Lourenço, Paulo Flores & Stéphane Clain, for APMTAC

David Greiner, Irene Arias & Manuel Tur, for SEMNI

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A TRIANGULAR VORTEX GENERATOR MODELING ON A DU97-W-300 AIRFOIL BY A SOURCE TERM MODEL

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Abstract. *The importance of improving the performance of thick airfoils usually used in multiple megawatt wind turbines in offshore platforms has increased in the last few years. The main objective of these airfoils is to ensure the blade structure rather than have a good aerodynamic performance. Vortex Generators (VGs) excel in this particular aspect due to its low cost of installation and its simplicity of operation. VGs are effective passive flow control devices when approaching the problem of improving the aerodynamic response of thick airfoils and delay flow separation. In the current work, the airfoil DU97-W-300 has been simulated with a VG located on the suction surface.*

In order to define as best as possible the existence of the VG and not increase the density of the CFD mesh a source term model has been used. The main goal of this article is to test the suitability of this kind of model by comparing the CFD results with experimental data of the lift and drag coefficients. RANS based simulations have been used in order to simulate the performance of the VG on the airfoil. After the comparisson of coefficients, a study of the evolution of the vortex generated by the VG model is made by studying the primary vortex vertical path, the vortex strength by studying the circulation and the size of the vortex at different angles of attack in order to understand how the VG performs at $Re=2 \cdot 10^6$.

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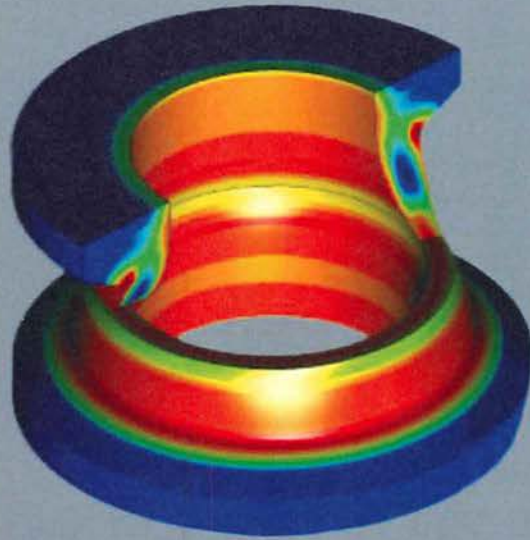
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Guimarães, July 03

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