

INVITED SESSION SUMMARY

Title of Session:

Sustainable mobility, solar vehicles and alternative solutions

Name, Title and Affiliation of Chair:

Chair: Prof. Gilberto Osorio-Gomez, EAFIT University, Medellín Colombia

Co-Chair: Prof. Cristiano Fragassa, Bologna University, Bologna, Italy

Co-chair: Dr. Chris Selwood, Event Director World Solar Challenge

Details of Session (including aim and scope):

The aim of this session is to discuss research results around alternative mobility and energy efficiency on road vehicles. Several cutting edge research projects regarding new developments on this topic will be exposed and discussed. A disclosure and discussion around sustainable mobility is proposed. Other purpose of this session is to uncover certain developments on competition solar cars to improve the general scientific development on this field.

According to the European Environment Agency (EEA) on 2014, the transportation sector represented the 20% of the total greenhouse gas emissions in Europe where the conventional cars contributed with more than the half of the total transportation releases. The solar car projects aim to develop zero-emission vehicles while using and charging. These fully autonomous automobiles are design to obtain from the sun the energy needed to move and do not use the grid electrical energy, that in most cases comes from non-renewable sources.

The solar car development involves innovation in multiple engineering areas such as aerodynamics, control, mechanics, electronics, solar panels, and others. These multidiscipline projects have been studied by different research groups and universities all over the world and nowadays are getting more popular time by time. The academic advances around these projects have pushed the technology boundaries in different aspects: high efficiency motors and drivers, low consumption tires, aerodynamic and low weight design, energy management, among other aspects.

Specific themes may include but are not limited to:

- Solar car efficiency improvement
- Alternative sustainable mobility
- Environmental impact of mobility solutions
- Aerodynamic and lightweight design
- Energy efficient drivetrains
- Energy management optimization

References

Pudney, Peter, and Phil Howlett. "Critical speed control of a solar car." *Optimization and engineering* 3.2 (2002): 97-107.

Taha, Zahari, et al. "A Review on Energy Management System of a Solar Car." *The 9th Asia Pacific Industrial Engineering & Management Systems Conference*. 2008.

Roche, David M. *Speed of Light: The 1996 World Solar Challenge*. Vol. 1. International Specialized Book Service Incorporated, 1997.

Betancur, Esteban, et al. "Design of structural parts for a racing solar car." *Advances on Mechanics, Design Engineering and Manufacturing*. Springer International Publishing, 2017. 25-32.

Mejía Gutiérrez, Ricardo, et al. "Design of a solar competition vehicle strategy with a Cyber Physical System approach." (2014).

Pavlovic A, Fragassa C (2015) General considerations on regulations and safety requirements for quadricycles. *International Journal for Quality Research*, Vol. 9 - N. 4: pp. 657–674

Fragassa C, Pavlovic A, Massimo S (2014) Using a Total Quality Strategy in a new Practical Approach for Improving the Product Reliability in Automotive Industry In: *Int.I Journal for Quality Research*, Vol. 8 - N. 3.: pp 297–310

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

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Proposed Schedule: Submission deadline: End of November 2016

Website URL of Call for Papers (if any):

None

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