## Editorial

## Francisco Payri and Jesús Benajes

CMT – Motores Térmicos, Universidad Politécnica de Valencia, Camino de Vera s/n, E-46022 Valencia, Spain E-mail: fpayri@mot.upv.es E-mail: jbenajes@mot.upv.es

**Biographical notes:** Francisco Payri graduated in Mechanical Engineering in 1971 and obtained his PhD degree in 1973 at the Universidad Politécnica de Madrid. In 1979 he moved to the Universidad Politécnica de Valencia, where he founded the research group known as CMT and became Professor in Thermal Engines in 1983. Since then, Prof. Payri has been the head of the Department of Thermal Machines and the director of the Institute CMT-Motores Térmicos. In these positions, Prof. Payri has coordinated numerous research activities in the domain of diesel engines. Prof. Payri is member of several organising committees in international congresses and editorial boards of scientific journals.

Jesús Benajes became Mechanical Engineer in 1983, at the Universidad Politécnica de Valencia. In the same year, he joined the research team CMT, and in 1987 he obtained a PhD degree in Mechanical Engineering. After different academic positions, in 2001 Jesús Benajes became Professor in Thermal Engines in the Universidad Politécnica de Valencia, again joining the Institute CMT-Motores Térmicos. During the last twenty years, Prof. Benajes has carried out research activities in different aspects of IC engines, like experimental techniques, gas exchange process and combustion. Presently he is leading a research team on injection and combustion in diesel engines.

During the last decades, the diesel engine has proven its ability to adapt itself to the stringent requirements imposed by the society for vehicle mobility. Aside from the important progress made in the reduction of pollutant emissions, this engine concept has seduced more and more drivers thanks to being able to meet the demands for fuel economy and driving comfort.

In recent years, the demands of the administrations have biased the development of the diesel engine towards the compliance with strict limitations in the emissions of nitrous oxides and particulates, while other important engine characteristics had to be put on a secondary level. However, this situation has started to change, because the society has nowadays become globally aware of the harmful effects of carbon dioxide emissions. Hence, the diesel engine of the future has to face up to a double challenge: to steadily decrease further the tail emissions of NO<sub>x</sub> and particulates, and also reduce, or at least, maintain fuel consumption – and thus  $CO_2$  emissions – at a moderate level.

New technologies and strategies must be applied to the basic concept of the diesel engine, in order to comply with these requirements. Keywords like new fuels, alternative combustion concepts, air and exhaust gas management, after-treatment

## 2 F. Payri and J. Benajes

devices and advanced engine control have become familiar subjects in the diesel engine research community. And the upcoming emission restrictions allow to anticipate that these technologies will be essential to reach the near zero emission targets aimed at for passenger cars.

This special issue of the *International Journal of Vehicle Design* comprises several interesting contributions from both the industry and the academia of different countries. The topics covered in this volume range from the basic studies of particular phenomena to the discussion of commercial applications, from theoretical and modelling work to experiments on the vehicles. Overall, the articles presented here are an excellent compilation covering several of the important strategies which can contribute to advance the diesel engine technology.

The guest editors wish to thank all the authors for their effort and commitment and for the quality of their contributions, and also all the people who have contributed to the edition of this volume.