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Reader in Thermodynamics

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About

Thanos obtained BEng in Manufacturing Engineering from Technological Education Institute of Piraeus in Greece in 1999 and BEng in Mechanical Engineering in 2001 from the University of Birmingham. Three years later (2004) Thanos obtained his PhD from the University of Birmingham.

From Birmingham, Thanos moved to Johnson Matthey plc, where he was a Research Scientist (2004-2005), in environmental catalysts and catalytic systems. In October 2005, he joined the University of Birmingham as a Lecturer 2005- 2010, Senior Lecturer (2010- 2011) and Reader in Thermodynamics since March 2011.

Thanos has published over 100 papers in journals and conference proceedings in the areas of fuels and fuel treatments, IC engines, combustion and emissions control technologies. His research covers both fundamentals and industrial applications and he is inventor on three patents. He has received funding awards from UK Research Councils, the Technology Strategy Board, local government together with money from industrial sources to finance the research.

Teaching

Teaching Interests

- Level 4 Fuels combustion and emissions
- Level 4 Transport, Energy and Emissions, Synoptic Engineering
- Level 2 Thermodynamics and Fluids
- Level 1 Thermodynamics

Postgraduate supervision

Doctoral Researchers Completed

- **B. Sawatmongkhon**, Modelling on Silver/Alumina HC-SCR catalyst, December 2011, Now working as University Academic in Thailand
- **P. Rounce**, Exhaust after-treatment for alternative fuels, June 2011. Now working for Ford Motor Company
- **A. Hasan**, Aftertretament for HCCI engines, August 2011.
- **N. Abdullah**, Impact of biofuels on high performance engines, June 2011. Now working as University Academic in Malaysia
- **S. Sitshebo**, Catalytic aftertreatment of NOx emissions using diesel fuel as reductant, May 2010. Now working for Caterpillar.
- **U. Elghawi**, Speciation and quantification of individual hydrocarbons in fuel reformers and HCCI engines, 2009.
- **K. Theinnoi**, Impact of diesel fuel on Silver/Alumina HC-SCR catalyst NOx reduction activity, 2008. Now working as University Academic in Thailand
- **S. Chuepeng**, Quantitative impact on engine performance and emissions of high proportion biodiesel blends, 2008. Now working as University Academic in Thailand
- **A.M.K. Abu-Jrui**, Control of diesel engine NOx emissions by selective catalytic reduction & exhaust gas fuel reforming, 2007. Now working as University Academic in Jordan.

DRs Writing up/submitted

- **P. Leung**, Diesel and gasoline exhaust gas fuel reforming. Now working for Caterpillar
- **J. Piaszyk**, Procedures for utilisation of neat Tallow biofuel in gen-set engines, esterification for Trucks and off-road vehicles. Now RF University of Birmingham
- **Chia S. Lau**, Low quality fuels upgrade for use in IC engines.
- **A. Ahmadi Nejat**, Modelling and detailed study of engine aftertreatment systems. Now working for Johnson Matthey.

Current Doctoral Researchers

Third Year

- **J.J. Chong**, Hybrid plasma assisted catalytic fuel reformer.
- **S. Gill**, Enhancing aftertreatment system performance through advanced combustion modes.
- **H.S. Tira**, Hydrogen production technolgies.
- **J. Shenker**, Tribology in IC Engines.
- **E. Sukjit**, Properties of lubricants and fuels including Biofuels and new alternative fuels for IC engines.

Second Year

- **Wentao Wang**, Hydrogen Production and Fuels Upgrade for IC Engines Using Catalytic Technologies.

- **D. Fennell**, CO2 reduction in vehicles through emission optimisation.
- **M. Umar**, Fuel blends combustion.

First Year

- **I. Lefort**, Energy efficient advanced diesel aftertreatment systems.
- **J.Wallis**, Next generation aftertreatment systems.

Other activities

Membership of Professional Bodies

- Chartered Mechanical Engineer
- Member of the Institution of Mechanical Engineers
- Fellow of Higher Education Academy

Publications

Selected referred journal papers

Hydrogen Production, Fuel Reforming and its Applications

- Leung P., Tsolakis A., Rodríguez-Fernández J., Golunski S. "Raising the Fuel Value and Recovering Exhaust Heat by On-Board Oxidative Reforming of Bioethanol." Energy Environ. Sci., 3 (2010) 780.
- Tsolakis A., Golunski S. E. "Sensitivity of process efficiency to reaction routes in exhaust-gas reforming of diesel fuel." Chem. Eng. J., 117, 131-136, 2006.
- Tsolakis A., Megaritis A., Golunski S.E., "Reaction profiles during exhaust-assisted reforming of diesel engine fuel." Energy & Fuels 19, 744-752, 2005.
- Tsolakis A, Megaritis A., Yap D. "Application of Exhaust Gas Fuel Reforming in Diesel and HCCI Engines Fuelled with Biofuels". Energy 33(3) (2008) 462-470. Tsolakis A., Megaritis A., Wyszynski M.L. "Application of Exhaust Gas Fuel Reforming in
- Compression Ignition Engines Fuelled by Diesel and Biodiesel Fuel Mixtures". Energy & Fuels, 17 (2003) 1464-1473.

Fuels, Biofuels, Synthetic Fuels and Other Energy Carrier Combustion

- Gill S.S., Tsolakis A., Dearn K., Rodríguez-Fernández J. Combustion Characteristics and Emissions of Fischer-Tropsch Diesel Fuels in IC Engines. Progress in Energy and Combustion Science, 37 (2011) 503-523.
- Lapuerta M., Armas O., Hernández J.J., Tsolakis A. Potential for Reducing Emissions in a Diesel Engine by Fuelling with Conventional Biodiesel and Fischer-Tropsch Diesel. Fuel 89 (2010) 3106 - 3113.
- Rounce P., Tsolakis A., Leung P., York A.P.E. A Comparison of Diesel and Biodiesel Emissions using Dimethyl Carbonate as an Oxygenated Additive. Energy & Fuels.
- Tsolakis A., Megaritis A., Wyszynski M.L., Theinnoi K. Engine Performance and Emissions of a Diesel Engine Operating on Diesel-RME Blends with EGR, Energy, 32 (2007) 2072-2080.
- Tsolakis A. Effects on Particle Size Distribution from the Diesel Engine Operating on RME-Biodiesel with EGR, Energy & Fuels 20 (2006) 1418-1424.
- Theinnoi K., Tsolakis A., Sitshebo S., Cracknell R.F., Clark R.H. Fuels Combustion Effects on a Passive Mode Silver/Alumina HC-SCR Catalyst Activity in Reducing NOx, Chem. Eng. J. 158 (2010) 468–473.

Hydrogen Combustion

- Tsolakis A., Torbati R., Megaritis A., Abu-Jrai A. Low Load Dual Fuel CI Engine Operation with On-board Reformer and Diesel Oxidation Catalyst. Effects on Engine Performance and Emissions, Energy & Fuels, 24 (2010) 302 – 308.
- Rodríguez-Fernández J., Tsolakis A., Cracknell R.F., Clark R.H. Combining GTL Fuel, Reformed EGR and HC-SCR Aftertreatment System to Reduce Diesel NOx Emissions. A Statistical Approach, Int. J. Hydrogen Energy, 34 (6) (2009) 2789-2799.
- Tsolakis A., Hernandez J.J., Megaritis A., Crampton M. Dual Fuel Diesel Engine Operation Using H2. Effects on Particulate Emissions, Energy & Fuels, 19, (2005) 418-425.
- Tsolakis A., Megaritis A. Partially premixed charge compression ignition engine with on-board H2 production by exhaust gas fuel reforming of diesel and biodiesel. Int. J. Hydrogen Energy, 30, 731-745, 2005.

Environmental Catalysts (Engine exhaust gas after-treatment)

- Chong J.J., Tsolakis A., Gill S.S., Theinnoi K., Golunski S.E. Enhancing the NO2/NOx ratio in Compression Ignition Engines by Hydrogen and Reformate Combustion, for Improved Aftertreatment Performance. Int. J Hydrogen Energy 35 (2010) 8723 - 8732.
- Sitshebo S., Tsolakis A., Theinnoi K. Promoting Hydrocarbon – SCR of NOx in Diesel Engine by Hydrogen and Fuel Reforming. Int. J. Hydrogen Energy, 34 (2009) 7842-7850.
- Houel V., Millington P., Rajaram R., Tsolakis A. Promoting Functions of H2 in Diesel-SCR Over Silver Catalysts, App. Catal. B: Env., 77 (2007) 29-34.
- Houel V., Millington P., Rajaram R., Tsolakis A. Fuel Effects on the Activity of Silver Hydrocarbon-SCR Catalysts, Appl. Catal. B: Env., 73 (2007) 203 - 207.
- Abu-Jrai A., Tsolakis A., The Effect of H2 and CO on the Selective Catalytic Reduction of NOx Under Real Diesel Engine Exhaust Conditions Over Pt/Al2O3, Int. J. Hydrogen Energy 32 (2007) 2073 -2080.
- Houel V., Millington P., Pollington S., Poulston S., Rajaram R., Tsolakis A. Chemical Deactivation of Ag/Al2O3 by Sulphur for Selective Reduction of NOx Using Hydrocarbons, Catal. Today 114 (2006) 334.
- Sawatmongkhon B., Tsolakis A., Theinnoi K., York A.P.E., Millington P. J., Rajaram R.R. Microkinetic Modelling for Selective Catalytic Reduction (SCR) of NOx by Propane in a Silver-Based Automotive Catalytic Converter, Applied Catalysis B: Environmental, 111 (2012) 165-177.

Book Chapters

- Megaritis A., Tsolakis A., Golunski S.E., Wyszynski M.L., 'Fuel reforming for Diesel Engines', Chapter in 'Direct Injection Combustion Engines and their Fuels for Automotive Applications in the 21st Century', Zhao H. (Ed.), Woodhead Publishing, 2009.
- York A.P.E. and Tsolakis A. Cleaner Vehicle Emissions. Encyclopedia of Materials: Science and Technology 2008;1– 7.