



UNIVERSITÀ DEGLI STUDI DELL'AQUILA

Prof. Fabio Fatigati

Curriculum scientifico

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Fabio Fatigati is a researcher in Mechanical Engineering and Energy Systems at the Department of Industrial and Information Engineering of the University of L'Aquila. Previously, he was a post-doc researcher from 2018 to 2019. He graduated in Mechanical Engineering in 2014 with honours, and he got his Ph.D in 2018 in Industrial and Information Engineering at University of L'Aquila with a thesis on the energy recovery in Internal Combustion Engine through ORC (Organic Rankine Cycle)- based power unit. In particular, he developed a theoretical and experimental analysis of the ORC-based power unit focusing the attention on the volumetric expander. Moreover, he developed and characterized, from an experimental and theoretical point of view, the novel technology of dual intake port applied to sliding rotary vane expander. His research work is also based on the experimental and theoretical study of other volumetric machines such as scroll expanders, sliding rotary vane pumps and screw pumps. Volumetric pumps, were experimentally and theoretically studied also in Thermal Management application. He performed also Real Drive Emission experimental analysis on a fully instrumented vehicle through a Portable Emission measurement system. He developed also experimental analysis on HHO application for an Internal Combustion Engine.

Another research field is that referred to the subsea rapid discharge hydraulic accumulators for the safety in off-shore oil drilling. In particular, the principal scope of the study is the development of model-based design procedure which guarantees that hydraulic accumulators have sufficient energy to actuate Blow out preventer BOP emergency valves which must ensure to close and seal the well if a blowout occurs. Moreover, he also performed energy analysis of drilling platform and studied the management of the materials on board. He also studied the indoor air quality in residential buildings.

Theoretical and experimental analysis are developed also to characterized from an energetic point of view the Sorption Enhanced Steam Methane Reforming System in collaboration with the Chemical Engineering Research group of the University of L'Aquila.

He participated also in a wide research collaboration between University of L'Aquila and the Imperial College (UK) about the off-design analysis of ORC-based power units fed by the exhaust gases of internal combustion engine. Moreover, a solar based-ORC system for domestic micro-cogeneration was experimentally and theoretically characterized during this collaboration.

He participated also in a wide research collaboration with the City University (UK) on the technological improvement of volumetric machines.

As part of its role, he is also the holder of the course of "Interaction between the machines and the environment" carried out as part of the degree course in Environmental Engineering at University of L'Aquila. He also holds lessons in the course of "Dynamic and control of the machines" and "Region energy planning" at University of L'Aquila. He is a member of the Teaching Staff ("Collegio dei Docenti") for the PhD in Industrial and inform

ation and Engineering at University of L'Aquila for the 37th cycle.

He is author of 35 papers on the most important international journals and conference proceedings of the energy sector. He participated as a speaker in many international congresses and symposiums about Energy issues. Furthermore, he took part in multiple European, National and Regional research projects. He was scientific responsible of two research projects. He was awarded with the prize "Carmelo Caputo 2016" for the best scientific paper in the PhD students category in the Machine and Systems for the Energy and the Environment, 71st ATI National Congress, September 2016. He was guest editor for a Special Issue on Energies MDPI and he was a reviewer for the most important journals in the energy sector. He is a founder member of the University Spin-off Energy Environmental Engineering Research s.r.l.-E3R s.r.l. He was a member of the Order of the Engineers of L'Aquila in the A sector-Industrial Sector.

Publications

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- (3) Fatigati, F., Di Giuliano, A., Carapellucci, R., Gallucci, K., Cipollone, R. Experimental characterization and energy performance assessment of a sorption-enhanced steam/methane reforming system; Processes; 2022; DOI: 10.3390/pr9081440;
- (4) Fatigati, F., Di Bartolomeo, M., Di Battista, D., Cipollone, R. Model based control of the inlet pressure of a sliding vane rotary expander operating in an ORC-based power unit (2021) Applied Thermal Engineering, 193, art. no. 117032, DOI: 10.1016/j.applthermaleng.2021.117032
- (5) Di Battista, D., Fatigati, F., Carapellucci, R., Cipollone, R. An improvement to waste heat recovery in internal combustion engines via combined technologies (2021) Energy Conversion and Management, 232, art. no. 113880. DOI: 10.1016/j.enconman.2021.113880
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- (11) Bianchi, G., Rane, S., Fatigati, F., Cipollone, R., Kovacevic, A. Numerical CFD simulations and indicated pressure measurements on a sliding vane expander for heat to power conversion applications (2019) *Designs*, 3 (3), art. no. 31, pp. 1-13. DOI: 10.3390/designs3030031
- (12) Fatigati, F., Di Bartolomeo, M., Cipollone, R. Dual intake rotary vane expander technology: Experimental and theoretical assessment (2019) *Energy Conversion and Management*, 186, pp. 156-167. DOI: 10.1016/j.enconman.2019.02.026
- (13) Fatigati, F., Di Bartolomeo, M., Di Battista, D., Cipollone, R. Experimental and numerical characterization of the sliding rotary vane expander intake pressure in order to develop a novel control-diagnostic procedure (2019) *Energies*, 12 (10), art. no. 1970. DOI: 10.3390/en12101970
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- (18) Fatigati, F.; Di Giovine, G.; Cipollone, R. Feasibility Assessment of a Dual Intake-Port Scroll Expander Operating in an ORC-Based Power Unit. *Energies* 2022, 15(3), 770; <https://doi.org/10.3390/en15030770>.
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