

Activities in 2008 of the research group of Prof. Paulo M. S. T. de Castro

Faculdade de Engenharia da Universidade do Porto, and LAETA (IDMEC-FEUP)
December 2008

Main contributors in 2008

- Daniel F C Peixoto
- Miguel A V de Figueiredo
- Paulo Coelho Moreira Azevedo¹
- Paulo M S Tavares de Castro
- Pedro M G P Moreira²
- Sérgio M O Tavares
- Stefan D Pastrama (Universitatea Politehnica Bucuresti)
- Valentin Richter-Trummer

Projects

- EU, "DATON - Innovative fatigue and damage tolerance methods for the application of new structural concepts", contract No. AST3-CT-2004-516053; project leader: Prof P Horst, TU Braunschweig, April 2005 - Sept 2008.
- FCT, "WELDING - Fiber Bragg grating sensors for modelling of friction stir welding (FSW) and laser beam welding (LBW)", contract FCT PTDC/EME-TME/66362/2006, July 2007 - June 2009.
- FCT, "EURNEX - Network of excellence", contract FCT POCI/V.5/C0006/2005, Oct 2007 - Dec 2008.
- MIT-Portugal Programme, "New design concepts for aeronautical products welded by friction stir", 2007 - 2010.
- ESA, Technology and Research Programme "Damage tolerance of cryogenic pressure vessels", coord. MT-Aerospace (with INEGI), 2008.

Proposals

- EU, FP7, Programme "Marie Curie Initial Training Networks" - Call ID "FP7-PEOPLE-ITN-2008" - Proposal N°237934 "INTEGRAL", with ALSTOM Transport, ALENIA, GKSS, TU Braunschweig, U Pisa, U Patras, UST Lille. Proposal coord.: PMST de Castro; prepared with Dr PMGP Moreira, of IDMEC.
- FCT, MIT-Portugal Programme, call with deadline Oct.15, 2008 "Fatigue and fracture behaviour of novel structural solutions for railways - rolling stock", with ALSTOM Transport, UTAD, UST Lille, MIT. Proposal coord.: PMST de Castro, prepared with Dr PMGP Moreira (already at INEGI).
- ESA, Proposal Number WM/WMP/016.08 in response to the ESA statement of work QM/08-927/TG "Stress corrosion testing of PMMC and friction stir welded PMMC materials"; Technical proposal prepared by GKSS-Forschungszentrum Geesthacht GmbH (GKSS) - Institute of Materials Research, Geesthacht, Germany and INEGI - Institute of Mechanical Engineering and Industrial Management, Portugal. Proposal coord.: Dr Jorge dos Santos, GKSS; coord in Portugal: PMST de Castro; proposal prepared with Dr PMGP Moreira, of INEGI.

¹ left in Nov. 2008 to CERN, Geneva, Switzerland.

² left in Sept. 2008 to INEGI (LOME), Porto, Portugal.

Doctorates

2008

- Pedro Miguel Guimarães Pires Moreira, "Lightweight stiffened panels: mechanical characterization of emerging fabrication technologies", FEUP, supervisor: PMST de Castro; Juri: AA Fernandes (Presid.), Peter Horst (TU Braunschweig, Germany, external examiner), Jorge dos Santos (GKSS, Germany, external examiner), Manuel Freitas (IST), J A Martins Ferreira (Univ Coimbra), PMST de Castro.

Current

- Sérgio M O Tavares, "New design concepts for aeronautical products welded by friction stir", FEUP - Doctoral Programme in Leaders for Technological Industries (MIT-Portugal Programme, focus Engineering Design and Advanced Manufacturing - EDAM); supervisor: Paulo MST de Castro; co-supervisors: Pedro Vilaça (IST), Jorge dos Santos (GKSS, Germany). Start: Sept. 2007; work to be performed in Portugal, Germany (GKSS) and USA (MIT, Jan.-July 2009).
- Valentin J. Richter-Trummer, "Integrated design solutions for structures manufactured with FSW, including effects of residual stresses and damage tolerance criteria", FEUP Doctoral Programme in Mechanical Engineering, supervisor: Paulo MST de Castro; co-supervisors Pedro Vilaça (IST), Jorge dos Santos (GKSS, Germany). Start: March 2008; work to be performed in Portugal and Germany (GKSS).
- Plácido Manuel Pinto Afonso, Relationships between S&T research and design in Portugal and Finland; FEUP Doctoral Programme in Industrial Engineering and Management; work at FEUP and Taideteollinen korkeakoulu Helsinki (University of Art and Design Helsinki); superv. In Finland: Tapio Yli-Viikari; FEUP superv: A Torres Marques; FEUP co-superv.: Paulo MST de Castro. Start: Oct. 2008.
- Carlos Miguel Correia Albuquerque, Advanced methodologies for fatigue analysis of high speed railways bridges; FEUP Doctoral Programme in Civil Engineering; supervisor: Rui Calçada (Depart. of Civil Engng., FEUP); co-supervisor: Paulo MST de Castro. Currently preparatory work; start 2008.

Master degrees

2008

- Valentin Richter-Trummer, "Characterization of different aluminum alloys of the series 6000 and of their joining processes", Mestrado Integrado em Engenharia Mecânica da Faculdade de Engenharia da Universidade do Porto - FEUP, supervisor: PMST de Castro, Feb. 2008
- Paulo Coelho Moreira Azevedo, "A numerical and experimental analysis of fatigue and fracture mechanics problems", Mestrado Integrado em Engenharia Mecânica da Faculdade de Engenharia da Universidade do Porto - FEUP, supervisor: PMST de Castro, July 2008
- Daniel Filipe Coutinho Peixoto, "Estudo do contacto roda/carril: análise de tensões e fadiga" (in Portuguese), Mestrado Integrado em Engenharia Mecânica da Faculdade de Engenharia da Universidade do Porto - FEUP, supervisors: PMST de Castro, LAA Ferreira, July 2008
- António José de Jesus Gomes, "Metodologias de desenvolvimento de produto: influência da utilização de uma metodologia estruturada" (in Portuguese), Mestrado em *Design* Industrial da Faculdade de Engenharia da Universidade do Porto - FEUP, supervisor: PMST de Castro, Dec. 2008

Current

- Afonso de Sousa Tavares Nogueira, Tema: análise de estruturas de autocarros, trabalho na empresa CaetanoBus, supervisor na empresa: Filipe Fernandes; co-supervisores na FEUP: Mário Vaz, Paulo MST de Castro e Miguel AV de Figueiredo
- Miguel Alves Ribeiro Veloso de Castro, Tema: processos de compensação de deformações em quinadoras, trabalho na empresa ADIRA, supervisor: Eng J Bessa Pacheco; co-supervisor na FEUP: Paulo MST de Castro

Publications

Book chapters

- P M G P Moreira, V Richter-Trummer, P M S T de Castro, "Fatigue behaviour of FS, LB and MIG welds of AA6061-T6 and AA6082-T6", invited book chapter, in: George C Sih, ed, "Multiscale Fatigue Crack Initiation and Propagation of Engineering Materials - Structural Integrity and Microstructural Worthiness", Springer Science + Business Media BV, pp.85-111, 2008

Papers in publications listed in ISI Web of Knowledge

- PMGP Moreira, FMF de Oliveira, PMST de Castro, "Fatigue behaviour of notched specimens of friction stir welded aluminium alloy 6063-T6", *Journal of Materials Processing Technology*, vol.207, (1-3), 2008, pp.283-292
- PMGP Moreira, AMP de Jesus, AS Ribeiro, PMST de Castro, "Fatigue crack growth in friction stir welds of 6082-T6 and 6061-T6 aluminium alloys: A comparison", *Theoretical and Applied Fracture Mechanics*, vol.50, (2), 2008, pp.81-91
- V Richter-Trummer, SMO Tavares, PMGP Moreira, PMST de Castro, "Friction stir welding of aluminium alloys and damage tolerance of integral monolithic structures", *Mechanika*, nr.5, (73), 2008, pp.18-22
- PMGP Moreira, T Santos, SMO Tavares, V Richter-Trummer, P Vilaça, PMST de Castro, "Mechanical characterization of friction stir welds of two dissimilar aluminium alloys of the 6xxx series", *Advanced Materials Forum IV*, vols. 587-588, 2008, pp. 430-434, (paper presented at the 13th Conference of the Sociedade Portuguesa de Materiais/4th International Materials Symposium, Apr 1-4, 2007 Porto, Portugal)
- FJP Chaves, LFM da Silva, PMST de Castro, "Adhesively bonded T-joints in polyvinyl chloride windows", *Proc. IMechE*, vol. 222, *Part L: J. Materials: Design and Applications*, 2008, pp.159-174
- PMGP Moreira, T Santos, SMO Tavares, V Richter-Trummer, P Vilaça, PMST de Castro Mechanical and metallurgical characterization of friction stir welding joints of AA6061-T6 with AA6082-T6, *Materials & Design*, vol. 30, (1), 2009, pp.180-187
- AMP de Jesus, MAV de Figueiredo, AS Ribeiro, PMST de Castro, AA Fernandes, "Residual lifetime assessment of an ancient riveted steel road bridge", *Strain*, in press

Papers in national journals

- V Richter-Trummer, SMO Tavares, PMGP Moreira, MAV de Figueiredo, PMST de Castro, "Residual stress measurement using the contour and the sectioning methods in a MIG weld: effects on the stress intensity factor", *Ciência e Tecnologia dos Materiais*, vol.20, (1/2), Jan-Jul 2008, pp.114-119

International conferences

- PMGP Moreira, AMP de Jesus, AS Ribeiro, PMST de Castro, "Fatigue crack growth in friction stir welds of 6082-T6 and 6051-T6 aluminium alloys: a comparison", 11th Portuguese Conference on Fracture, Caparica, UNLisboa, Portugal, Feb 13-15, 2008; in proceedings, pp.229-237
- SD Pastrama, PMGP Moreira, PMST de Castro, G Jiga, "An overdeterministic algorithm for stress intensity factor calculation using finite element results" 11th Portuguese Conference on Fracture, Caparica, UNLisboa, Portugal, Feb 13-15, 2008; in proceedings, pp.325-332

- SMO Tavares, PMGP Moreira, SD Pastrama, PMST de Castro, "Stress intensity factors by numerical evaluation in cracked structures" 11th Portuguese Conference on Fracture, Caparica, UNLisboa, Portugal, Feb 13-15, 2008; in proceedings, pp.315-324
- V Richter-Trummer, SMO Tavares, PMGP Moreira, MAV de Figueiredo, PMST de Castro, "Residual stress measurement using the contour and the sectioning methods in a MIG weld: effects on the stress intensity factor", 11th Portuguese Conference on Fracture, Caparica, UNLisboa, Portugal, Feb 13-15, 2008; in proceedings, pp.351-359
- SMO Tavares, PMGP Moreira, PMST de Castro, "Friction stir welding of T-joints fabricated with three parts", International Conference on Welded Structures, DFE 2008, April 24-26, 2008, Miskolc, Hungary
- DFC Peixoto, LAA Ferreira, PMST de Castro, "Rail/wheel contact: stress analysis and fatigue", poster apresentado no 16th International Symposium EURNEX - Žel 2008 "Towards more competitive European rail system", Žilina, Slovakia, June 4-5, 2008, poster, proceedings vol.2, p.324
- V Richter-Trummer, SMO Tavares, PMGP Moreira, PMST de Castro, "Friction stir welding of aluminium alloys and damage tolerance of integral monolithic structures", 16th International Symposium EURNEX - Žel 2008 "Towards more competitive European rail system", Žilina, Slovakia, June 4-5, 2008, proceedings, vol.1, pp.119-127
- SMO Tavares, PCM Azevedo, B Emilio, V Richter-Trummer, MAV Figueiredo, P Vilaça, PMST de Castro, "Friction stir welding of T-joints in dissimilar aluminum alloys", 2008 ASME International Mechanical Engineering Congress and Exposition, paper IMECE2008-67522, November 2-6, 2008, Boston, Massachusetts, USA
- SMO Tavares, V Richter-Trummer, PMGP Moreira, PMST de Castro, "Methodologies for fatigue life determination in integral stiffened panels", 9th European Aeronautics Science Network - EASN Workshop on Mobility and Research, Technical University of Munich, Garching, Munich, November 27-28, 2008 (ppt slides only)

National conferences

- PMGP Moreira, AMP Jesus, AS Ribeiro, PMST de Castro, "Fatigue crack growth behaviour of the friction stir welded 6082-t& aluminium alloy", 7º Congresso Nacional de Mecânica Experimental, APAET, Vila Real, Jan 23-25, 2008, in: Livro de Resumos, AMP de Jesus, JTQS Pinto, eds., pp.259-261
- PMGP Moreira, V Richter-Trummer, RAM de Silva, MAV de Figueiredo, PMST de Castro, "Residual stress evaluation of a MIG welded plate using the sectioning method and the hole drilling method", 7º Congresso Nacional de Mecânica Experimental, APAET, Vila Real, Jan 23-25, 2008, in: Livro de Resumos, AMP de Jesus, JTQS Pinto, eds, pp.277-279

Other communications

- Daniel F C Peixoto, presentation of results of FCT EURNEX project at the Research seminar in the framework of projects EU 'DATON', FCT 'EURNEX' and FCT 'WELDING', intended for researchers of the Civil Engng Depart of FEUP, at INEGI-IDMEC FEUP, Porto, June 25, 2008 (ppt slides only)
- Pedro M G P Moreira, presentation of results of DATON project at the Research seminar in the framework of projects EU 'DATON', FCT 'EURNEX' and FCT 'WELDING', intended for researchers of the Civil Engng Depart of FEUP, at INEGI-IDMEC FEUP, Porto, June 25, 2008 (ppt slides only)
- Valentin Richter-Trummer, presentation of results of FCT WELDING project at the Research seminar in the framework of projects EU 'DATON', FCT 'EURNEX' and FCT 'WELDING', intended for researchers of the Civil Engng Depart of FEUP, at INEGI-IDMEC FEUP, Porto, June 25, 2008 (ppt slides only)
- Daniel F C Peixoto, Lucas F M da Silva, Luís Andrade Ferreira, Miguel A V de Figueiredo, Paulo M S Tavares de Castro, Pedro M G P Moreira, Sérgio M O Tavares, Valentin Richter-Trummer, "Material circulante: requisitos, materiais e tecnologias - Introdução geral, alguns resultados e competências na FEUP", invited communication, Ciclo de

Formação Avançada na Ferrovia - Módulo Geral, FEUP - Centro de Saber da Ferrovia, Porto, July 7-8, 2008 (presented by Paulo M S T de Castro; ppt slides only)

- Paulo C M Azevedo, Pedro M G P Moreira, Sérgio M O Tavares, Valentin Richter-Trummer, and Paulo M S T de Castro, "Fracture and fatigue behaviour of FSW Joints", invited presentation at Summer School "Virtual Institute - Improving Performance and Productivity of Integral Structures through Fundamental Understanding of Metallurgical Reactions in Metallic Joints - VI-IPSUS", GKSS, Hamburg, 8-12 Sept. 2008 (ppt slides only)
- Daniel F C Peixoto, "Application of the Dang Van criterion to the wheel/rail contact problem: preliminary results", presentation in: "Workshop: The Dang Van fatigue criterion", October 27, 2008, FEUP campus, INEGI-IDMEC building (ppt slides only)

Project reports

- Daniel F C Peixoto, contribution to report: R Delgado, R Calçada, Coords., "Descarrilamento no Tua em 22 de Agosto de 2008", Relatório Preliminar, (in Portuguese), Centro de Saber da Ferrovia da Faculdade de Engenharia da Universidade do Porto - CSF-FEUP, Out. de 2008 (secção 04 - Estudos de Natureza Mecânica, por JFS Gomes, MAP Vaz, PMGP Moreira, JM Monteiro, NVM Ramos e DFC Peixoto)
- Daniel F C Peixoto (IDMEC), Pedro M G P Moreira (INEGI), Mário Vaz (INEGI), "Descarrilamento no Tua em 22 de Agosto de 2008: Análise do contacto roda/carril", internal tech. note, Dec. 2008
- Paulo C M Azevedo, with collaboration of: Valentin Richter-Trummer, Sérgio M O Tavares, Pedro M G P Moreira, Paulo M S T de Castro, "Evaluation of the propagation of an inclined crack for the DaToN stiffened panel under uniaxial loading using 3D FE analysis", Working Document DaToN-WD6-WP2-1.0/IDMEC, May 15, 2008
- Pedro M G P Moreira, Abílio M P de Jesus, Paulo C M Azevedo, Miguel V A de Figueiredo, Paulo M S Tavares de Castro, "ESA Technology and Research Programme - Damage tolerance of cryogenic pressure vessels", INEGI Report version 1.1, November 21, 2008
- Pedro M G P Moreira, Valentin Richter-Trummer, Miguel A V de Figueiredo, Fernando M F de Oliveira, P M S T de Castro, "Stiffened cracked panel, DaToN specimen: Fatigue life and experimental measurements", DaToN-WD7-WP3-1.0/IDMEC, July 2008
- Sérgio M O Tavares, Valentin Richter-Trummer, Pedro M G P Moreira, Paulo M S T de Castro, "Calculation of stress intensity factors and prediction of fatigue crack growth considering residual stress effects in DaToN stiffened panels", DaToN-WD8-WP3-WP4-1.0/IDMEC, Sept 2008
- Valentin Richter-Trummer, with collaboration of: Sérgio M O Tavares, Pedro M G P Moreira, Paulo C M Azevedo, Paulo M S T de Castro, "Through-the-thickness stress intensity factor calibration for the DaToN NLR panel", DaToN-WD9-WP4-1.0/IDMEC, Sept 2008

Patents

- Application, "Soldadura por fricção linear - Soldaduras em T", número 103867, by Sérgio M O Tavares *et al*, Instituto Nacional da Propriedade Industrial.

Meetings of projects of the group

- UNIFE, Brussels, Belgium, informal meeting for project proposals discussion in the context of "Pole 3 - Rolling Stock" of EURNEX association, Jan. 10-11, 2008; PMST de Castro, AA Fernandes

- MT-Aerospace, Augsburg, Germany, *kick-off* of Project: **ESA Technology and Research Programme - Damage Tolerance of Cryogenic Pressure Vessels**, MT-Aerospace, Germany, and INEGI, Apr 16-17, 2008; PMST de Castro, PMGP Moreira
- FOI, Stockholm, Sweden, **DATON** project meeting, Mar 17-18, 2008; PMST de Castro, PMGP Moreira, SMO Tavares, V Richter-Trummer
- ALSTOM Transport, Paris, St Ouen, France, meeting with FP7 Marie Curie "INTEGRAL" proposal partners, July 18, 2008; PMST de Castro
- European Commission, Brussels, Belgium, final meeting of **DATON** project, Sept 29-30, 2008; PMST de Castro, PMGP Moreira
- TAP Maintenance & Engineering, Lisbon, 3rd progress meeting of the project: "New design concepts for aeronautical products welded by friction stir", **MIT-Portugal Programme**, 2007 - 2010, December 16, 2008; SMO Tavares, PMST de Castro, P Vilaça. J Carvalho (TAP-ME), MA Santos (OGMA) *et al.*

Conferences, meetings and short courses attended; stays at labs.

Daniel FC Peixoto

- **Žilina**, Slovakia, 16th International Symposium EURNEX - Žel 2008 "Towards more competitive European rail system", June 4-5, 2008
- **Lisbon**, Portugal, experimental work at IST Lisbon; IST hosts and participants: P Vilaça, B Emílio; July 24, 2008
- **Porriño**, Spain, "I Jornada Soldadura de Aleaciones de Aluminio - Presentación del proyecto Diseño, desarrollo y fabricación de elementos estructurales ligeros para la fabricación de componentes aeronáuticos", AIMEN, Sept 25, 2008
- **Lisbon**, Portugal, meeting at IST Lisbon with Prof L Reis concerning Dang Van fatigue criterion, Oct 20, 2008

Miguel AV de Figueiredo

- **Vila Real**, Portugal, 7º Congresso Nacional de Mecânica Experimental, APAET, UTAD, Jan 23-25, 2008
- **Porto**, Portugal, Conf. "Air Transport Systems and Services: Industry and Research Perspectives to a Future Development", FEUP, MIT-Portugal Programme, June 26-27, 2008
- **Porto**, Portugal, Ciclo de Formação Avançada na Ferrovia - Módulo Geral, FEUP - Centro de Saber da Ferrovia, Porto, July 7-8, 2008
- **Lisbon**, Portugal, experimental work at IST Lisbon; IST hosts and participants: P Vilaça, B Emílio; July 24, 2008
- **Porriño**, Spain, "I Jornada Soldadura de Aleaciones de Aluminio - Presentación del proyecto Diseño, desarrollo y fabricación de elementos estructurales ligeros para la fabricación de componentes aeronáuticos" AIMEN, Sept 25, 2008

Paulo CM Azevedo

- **Lisbon**, Portugal, experimental work at IST Lisbon; IST hosts and participants: P Vilaça, B Emílio; July 24, 2008
- **Porriño**, Spain, "I Jornada Soldadura de Aleaciones de Aluminio - Presentación del proyecto Diseño, desarrollo y fabricación de elementos estructurales ligeros para la fabricación de componentes aeronáuticos" AIMEN, Sept 25, 2008

Pedro MGP Moreira

- **Vila Real**, Portugal, 7º Congresso Nacional de Mecânica Experimental, APAET, UTAD, Jan 23-25, 2008
- **Caparica**, Portugal, 11th Portuguese Conference on Fracture, UNLisboa, Feb 13-15, 2008

- **Stockholm**, Sweden, DATON project meeting, Mar 17-18, 2008
- **Munich**, Germany, visit: Aerospace 08: Testing, Design, Manufacturing, New Munich Trade Fair Centre, Apr 15, 2008
- **Augsburg**, Germany, MT-Aerospace, *kick-off* of Project: ESA Technology and Research Programme - Damage Tolerance of Cryogenic Pressure Vessels, MT-Aerospace, Germany, and INEGI, Apr 16-17, 2008
- **Porto**, Portugal, Conf. "Air Transport Systems and Services: Industry and Research Perspectives to a Future Development", FEUP, MIT-Portugal Programme, June 26-27, 2008
- **Porto**, Portugal, Ciclo de Formação Avançada na Ferrovia - Módulo Geral, FEUP - Centro de Saber da Ferrovia, July 7-8, 2008
- **Lisbon**, Portugal, experimental work at IST Lisbon; IST hosts and participants: P Vilaça, B Emílio; July 24, 2008
- **Porriño**, Spain, "I Jornada Soldadura de Aleaciones de Aluminio - Presentación del proyecto Diseño, desarrollo y fabricación de elementos estructurales ligeros para la fabricación de componentes aeronáuticos" AIMEN, Sept 25, 2008
- **Brussels**, Belgium, European Commission, final meeting of DATON project, Sept 29-30, 2008

Paulo MST de Castro

- **Brussels**, Belgium, UNIFE, informal meeting for project proposals discussion, in the context of "Pole 3 - Rolling Stock" of EURNEX association, Jan. 10-11, 2008 (with AA Fernandes)
- **Vila Real**, Portugal, 7º Congresso Nacional de Mecânica Experimental, APAET, UTAD, Jan 23-25, 2008
- **Caparica**, Portugal, 11th Portuguese Conference on Fracture, UNLisboa, Feb 13-15, 2008
- **Stockholm**, Sweden, FOI, DATON project meeting, Mar 17-18, 2008
- **Munich**, Germany, visit: Aerospace 08: Testing, Design, Manufacturing, New Munich Trade Fair Centre, April 15, 2008
- **Augsburg**, Germany, MT-Aerospace, *kick-off* of Project: ESA Technology and Research Programme - Damage Tolerance of Cryogenic Pressure Vessels, MT-Aerospace, Germany, and INEGI, Apr 16-17, 2008
- **Žilina**, Slovakia, 16th International Symposium EURNEX - Žel 2008 "Towards more competitive European rail system", June 4-5, 2008
- **Porto**, Portugal, Conf. "Air Transport Systems and Services: Industry and Research Perspectives to a Future Development", FEUP, MIT-Portugal Programme, June 26-27, 2008
- **Porto**, Portugal, Ciclo de Formação Avançada na Ferrovia - Módulo Geral, FEUP - Centro de Saber da Ferrovia, July 7-8, 2008
- **Lisbon**, Portugal, experimental work at IST Lisbon; IST hosts and participants: P Vilaça, B Emílio; July 24, 2008
- **Hamburg**, Germany, Virtual Institute - Improving Performance and Productivity of Integral Structures through Fundamental Understanding of Metallurgical Reactions in Metallic Joints - VI-IPSUS, GKSS, Sept 8-12 2008
- **Brussels**, European Commission, final meeting of DATON project, Sept 29-30, 2008
- **Boston**, Massachusetts, USA, 2008 ASME International Mechanical Engineering Congress and Exposition, November 2-6, 2008, (and ASME Fastening & Joining Technical Committee Meeting - 2008, ASME-IMECE 2008, Sheraton Boston, November 5, 2008)
- **Cambridge**, Massachusetts, USA, Massachusetts Institute of Technology - MIT, Nov.2-8, 2008, contacts with Prof T Eagar concerning PhD work of SMO Tavares and contacts with Prof Tomasz Wierzbicki concerning possible future projects
- **Lisbon**, TAP Maintenance & Engineering, Lisbon, 3rd progress meeting of the project: "New design concepts for aeronautical products welded by friction stir", MIT-Portugal Programme, 2007 - 2010, December 16, 2008; SMO Tavares, PMST de Castro, *et al*

Rui AM da Silva

- Lisbon, Portugal, experimental work at IST Lisbon; IST hosts and participants: P Vilaça, B Emílio; July 24, 2008

Stefan D Pastrama (Universitatea Politehnica Bucuresti)

- Caparica, Portugal, 11th Portuguese Conference on Fracture, UNLisboa, Feb 13-15, 2008

Sérgio MO Tavares

- Vila Real, Portugal, 7º Congresso Nacional de Mecânica Experimental, APAET, UTAD, Jan 23-25, 2008
- Caparica, Portugal, 11th Portuguese Conference on Fracture, UNLisboa, Feb 13-15, 2008
- Stockholm, Sweden, DATON project meeting, Mar 17-18, 2008
- Miskolc, Hungary, International Conference on Welded Structures, DFE 2008, 24-April 26, 2008
- Geesthacht, Germany, stay at GKSS, Solid State Joining Processes Department, working with Dr Jorge dos Santos, June-Dec. 2008
- Lyngby, Denmark, FSW Modelling Course, taught by Henrik Nikolaj Blicher Schmidt, DTU - Danmarks Tekniske Universitet, August 25-29, 2008
- Hamburg, Germany, Virtual Institute - Improving Performance and Productivity of Integral Structures through Fundamental Understanding of Metallurgical Reactions in Metallic Joints - VI-IPSUS, GKSS, Sept 8-12 2008
- Boston, Massachusetts, USA, 2008 ASME International Mechanical Engineering Congress and Exposition, November 2-6, 2008, (and ASME Fastening & Joining Technical Committee Meeting - 2008, ASME-IMECE 2008, Sheraton Boston, November 5, 2008)
- Cambridge, Massachusetts, USA, Massachusetts Institute of Technology - MIT, Nov.2-8, 2008, contacts with Prof T Eagar concerning PhD work of SMO Tavares and contacts with Prof Tomasz Wierzbicki concerning possible future projects
- Munich, Germany, 9th European Aeronautics Science Network - EASN Workshop on Mobility and Research, Technical University of Munich, Garching, Munich, November 27-28, 2008
- Lisbon, TAP Maintenance & Engineering, Lisbon, 3rd progress meeting of the project: "New design concepts for aeronautical products welded by friction stir", MIT-Portugal Programme, 2007 - 2010, December 16, 2008; SMO Tavares, PMST de Castro, *et al*

Valentin Richter-Trummer

- Caparica, Portugal, 11th Portuguese Conference on Fracture, UNLisboa, Feb 13-15, 2008
- Stockholm, Sweden, DATON project meeting, Mar 17-18, 2008
- Žilina, Slovakia, 16th International Symposium EURNEX - Žel 2008 "Towards more competitive European rail system", June 4-5, 2008
- Lisbon, Portugal, experimental work at IST Lisbon; IST hosts and participants: P Vilaça, B Emílio; July 24, 2008
- Hamburg, Germany, Virtual Institute - Improving Performance and Productivity of Integral Structures through Fundamental Understanding of Metallurgical Reactions in Metallic Joints - VI-IPSUS, GKSS, Sept 8-12 2008
- Geesthacht, Germany, stay at GKSS, Solid State Joining Processes Department, working with Dr Jorge dos Santos, Sept.-Dec. 2008
- Prague, Czech Republic, advanced course on Modeling of Localized Inelastic Deformation, taught by Milan Jirásek, Czech Technical University in Prague on Sept 22-26, 2008

- **Hamburg**, Germany, "COINS" EU project meeting, as a member of the GKSS delegation; meeting at AIRBUS Hamburg, Oct 28-30, 2008
- **Lisbon**, Portugal, advanced course in Structural Health Monitoring, Nov 24-27, 2008, IST, Lisbon; organizers: Afzal Suleman, Alfredo Guemes, (EC Specific Support Action ASA6-CT-2006-044636)

Networks

- PMST de Castro, AA Fernandes, European Rail Research Network of Excellence EURNEX, since 2004
- PMST de Castro, EASN - European Aeronautics Science Network, since 2005.

Editorial tasks

Editorial boards

- PMST de Castro, *Fatigue and Fracture of Engineering Materials and Structures*, (J Wiley-Blackwell), ISSN 8756-758X
- PMST de Castro, *International Journal of Structural Integrity*, (EMERALD), ISSN 1757-9864, since 2008
- PMST de Castro, *Mechanika*, (Kaunas University of Technology), ISSN 1392-1207
- PMST de Castro, *UPB Scientific Bulletin, Series D: Mechanical Engineering*, (Universitatea Politehnica Bucuresti), ISSN 14542358, since 2008

Other editorial tasks

- PMST de Castro, M Freitas (IST, Lisbon), P Camanho (FEUP, Porto), invited guest editors of a special issue of *Ciência e Tecnologia dos Materiais*: vol.20, (1/2), Jan-Jul 2008, pp.114-119: special issue with a selection of papers presented at the 11th Portuguese Conference on Fracture, UNLisboa, Caparica, Portugal, Feb 13-15, 2008

Refereeing for journals

- PMST de Castro, *Advances in Engineering Software*
- PMST de Castro, *Experimental Mechanics*
- PMST de Castro, *Fatigue and Fracture of Engineering Materials and Structures* (two in 2008, evaluated with Prof Lucas F M da Silva)
- PMST de Castro, *IEEE Transactions on Systems, Man and Cybernetics, Part A*
- PMST de Castro, *International Journal of Fatigue*

Organization of events

- Lecture by Prof. Gerard Mesmacque, Laboratoire de Mécanique de Lille, France, "Fatigue with Particular Application to Railways", April 24, 2008, FEUP (in the context of FCT project EURNEX POCI/V.5/C0006/2005)
- Research seminar, in the framework of projects EU 'DATON'¹, FCT 'EURNEX'², FCT 'WELDING'³, intended for researchers of the Civil Engng Depart of FEUP, at INEGI-IDMEC FEUP, Porto, June 25, 2008 (PMST de Castro, org.)

¹ European Union contract AST3-CT-2004-516053

² FCT contract POCI / V.5 / C0006 / 2005

³ FCT contract PTDC/EME-TME/66362/2006

- Lecture by Prof. **Uwe Zerbst**, of GKSS Research Centre Geesthacht GmbH (Institute of Materials Research, Materials Mechanics), "Fracture Mechanics in Railway Application", in: Ciclo de Formação Avançada na Ferrovia – Módulo Geral, Centro de Saber da Ferrovia – Faculdade de Engenharia da Universidade do Porto – CSF-FEUP, July 7-8, 2008
- Workshop: The Dang Van fatigue criterion, including a Lecture by Prof. **K Dang Van**, October 27, 2008, FEUP campus, INEGI-IDMEC building (PMST de Castro, J Seabra, orgs., in the context of FCT project EURNEX POCI/V.5/C0006/2005)
- Lecture by Eng. **Ricardo S. Pinto**, AIRBUS, Toulouse, "AIRBUS - an engineering and manufacturing company", Nov 12, de 2008, FEUP (SMO Tavares, PMST de Castro, F Pires, orgs.)

Scientific committees of conferences

- PMST de Castro, "Composites2009" – 2nd ECCOMAS Thematic Conference on the Mechanical Response of Composites, April 1-3, 2009, Imperial College London, (member of the Scientific Committee)
- PMST de Castro, Materiais 2009 "Recent Advances in Characterization, Processing, Design and Modelling of Structural and Functional Materials", (XIV Meeting of the Sociedade Portuguesa de Materiais, and V International Materials Symposium), Lisbon, IST, April 5-8, 2009 (member of the Scientific Advisory Committee)
- PMST de Castro, Mesomechanics 2009, University of Oxford, 24-26 June 2009 (member of the Scientific Committee)

Impacts

Previous work of the group was the object of at least 65 citations in 2008 as recorded in the SCOPUS database (as of Dec.1, 2008).

Visitors

The following exchange students were welcomed in the group during the first semester of 2008/2009:

- Vinícius Barros Rêgo, Universidade de Brasília, Brasil

Among others, the following visitors were welcomed at FEUP:

- Eduardo Arantes e Oliveira, current vice-chairman of the Class of Sciences of the Lisbon Academy of Sciences; June 13, 2008
- Gerard Mesmacque, Laboratoire de Mécanique de Lille, April 23-27, 2008
- J. Martins Ferreira, Universidade de Coimbra, Faculdade de Ciências e Tecnologia, April 7, 2008
- János Lógó, Associate Professor, Budapest University of Technology and Economics, Department of Structural Mechanics; June 13, 2008
- Javier Llorca, Instituto Madrileño de Estudios Avanzados en Materiales - IMDEA Materials, and Departamento de Ciencia de Materiales, Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos, Universidad Politécnica de Madrid, February 19, 2008
- Joel P. Clark, Professor of Materials Systems, MIT, Department of Materials Science and Engineering; June 23, 2008
- Jorge dos Santos, GKSS, Solid State Joining Processes research group, April 5-7, 2008
- Julius vom Ingelheim, Human Resources Director, VW Autoeuropa; April 30, 2008
- Keith Hunt, AugustaWestland Customer Service Manager Portugal; March 13, 2008

- Ky Dang Van, Professor, École Polytechnique, CNRS, Paris, France, October 27, 2008
- Luís Reis, IST, Depart. de Eng. Mecânica, Oct. 27, 2008
- Manuel de Freitas, IST, Depart. de Eng. Mecânica, April 7; June 23, Oct. 27, 2008
- Michel Lambert, European Space Agency, ESTEC, Thermal and Structures Division, Noordwijk, June 20, 2008
- Pascal Ghys, ALSTOM Transport, Rolling Stock Engineering, Structural Calculations Department Manager; June 11, 2008
- Peter H. Foss, GM Research and Development Center, Warren, January 23, 2008
- Peter Horst, Technischen Universität Braunschweig, Institut für Flugzeugbau und Leichtbau, April 5-7, 2008
- Rachel Davis, AgustaWestland, Customer Support Coordinator - Portugal; March 13, 2008
- Ric Parker, Rolls Royce, Director of Research and Technology; June 23, 2008
- Ricardo Pinto, AIRBUS Procurement equipment & systems, Toulouse; Nov. 12, 2008
- Sandor Kaliszky, member of the Hungarian Academy of Sciences; honorary rector of CISM, International Centre For Mechanical Sciences, Udine; June 13, 2008
- Sandra Neves, Academia de Formação ATEC - VW, Siemens, Bosch, AHK; April 30, 2008
- Susana Moretto, ALSTOM Transport, High Speed Market Developer, Oct. 2, 2008
- Telmo Roberto Strohaecker, Professor, Laboratório de Metalurgia Física (LAMEF), Universidade Federal do Rio Grande do Sul, Brasil, Sept. 22, 2008
- Tomasz Wierzbicki, MIT, Department of Mechanical Engineering, Professor of Applied Mechanics and Director, Impact and Crashworthiness Laboratory, July 4, 2008
- Uwe Zerbst, GKSS, Institute of Materials Research, Materials Mechanics, July 6-8, 2008

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- Daniela Silva, CEMUP, Porto, Portugal
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- Fundação para a Ciência e Tecnologia, Lisboa, Portugal
- INEGI, Porto, Portugal
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