**Kemal DAVUT, Dr.-Ing.**
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## EDUCATION

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|---|---|
| 2008-2013 | RWTH Aachen University, Chair for Metallurgy of Iron and Steel (IEHK), Ph.D.<br>*Carried out at:* Max Planck Institute for Iron Research, Duesseldorf.<br>**Topic:** Relation between microstructure and mechanical properties of a low alloyed TRIP-steel<br>**Supervisors:** P.D.Dr.-Ing. S. Zaefferer, Prof.Dr.-Ing. D. Raabe<br>**Grade:** Sehr gut (very good, best possible grade) |
| 2004-2006 | Middle East Technical University, Metallurgical and Materials Engineering, M.S., **Topic:** Characterization of Steel Microstructures by Magnetic Barkhausen Noise Technique"; **Supervisor:** Prof.Dr. C. Hakan Gür |
| 2000-2004 | Middle East Technical University, Metallurgical and Materials Engineering, B.S. |

## ACADEMIC POSITIONS

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| **03/2015 -** | Assistant Professor, Department of Metallurgical and Materials Engineering, Atilim University, Turkey |
| **03/2013 -** | Senior Research Associate, Metal Forming Center of Excellence<br>Atilim University, Turkey |
| **04/2008-12/2013** | Project Assistant, Department of Microstructure Physics and Alloy Design<br>Max Planck Institute fuer Eisenforshung (MPIE), Duesseldorf, Germany |
| **12/2004-03/2008** | Teaching Assistant, Department of Metallurgical and Materials Engineering, Atilim University, Turkey |

## ADMINISTRATIVE DUTIES

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| **04/2015-05/2017** | Executive Board Member, Metal Forming Center of Excellence, Atilim Uni. |

## RESEARCH INTERESTS

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| **1** | Advanced high strength steels (TRIP, TWIP, DP, Q&P) |
| **2** | Microstructure and micro-texture analysis (SEM, EDS, EBSD) |
| **3** | Quantifying microstructure – property relations in metallic materials |
| **4** | Magnetic Barkhausen noise analysis |
| **5** | In-situ & micro-mechanical testing |

## PROFESSIONAL SERVICE

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|---|---|
| **1** | Referee, Journal of Alloys and Compounds |
| **2** | Referee, Hittite Journal of Science and Engineering |
| **3** | Organizing Committee Member, 47th International Cold Forging Group Meeting (ICFG 2014) |
| **4** | Conference Co-chair, 2nd International Metal Forming Conference (METFORM 2014) |
| **5** | Conference chair and Editor of Proceedings, 11th International Conference on Barkhausen Noise & Micromagnetic Testing (ICBM 11), 2015 |
| **6** | Co-chair, Struers & EMCO Test & ALS Metallography and Hardness Testing Seminar (2016) |
| **7** | Co-chair, Zeiss Electron Microscopy Workshop (2017) |

## INDUSTRIAL TRAININGS GIVEN

| | |
|---|---|
| **1** | EBSD-based Texture Analysis, Theory and Application<br>*(Ereğli Demir ve Çelik Fabrikaları T.A.Ş., Ar-Ge Birimi)* |
| **2** | Metallography, Optical Microscopy, Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray Spectroscopy (EDS)<br>*(Tosyalı Toyo Çelik A.Ş.) and (Asil Çelik San. ve Tic. A.Ş.)* |
| **3** | Temel Malzeme Bilgisi ve Demir Çelik Metalurjisi<br>*(Erdemir Üretim Mühendisliği Sertifika Programı – TEDUSEM)* |
| **4** | Heat Treatment and Surface Hardening of Ferrous Alloys<br>*(Eti Makine San. ve Tic. A.Ş).* |
| **5** | Aging of Aluminum Alloys<br>*(Cansan Alüminyum Profil San.Tic.A.Ş)* |
| **6** | Quantitative Metallography Applications via imageJ<br>*(FNSS Savunma Sistemleri A.Ş.)* |

## PUBLICATIONS

| | |
|---|---|
| **1** | E. Billur, B.Çetin, O. Music, C. Şimşir, **K. Davut**, "A Potential Solution to Mystical Materials in Indentation Test", *Procedia Engineering*, 207, p.1952-1957, 2017 |
| **2** | C. Şimşir, B. Çetin, M.Efe, **K. Davut**, B. Bayramin, "A Material Perspective on Consequence of Deformation Heating During Stamping of DP Steels", *Journal of Physics Conference Series*, 896 (1), id:012059, 2017 |
| **3** | K. Davut, A. Yalçın, B. Çetin, "Multiscale Microstructural Analysis of Austempered Ductile Iron Castings, *Microscopy and Microanalysis*, 23 (S1), p.350-351, 2017 |
| **4** | B. Çetin, H. Kurtuldu, G. Durkaya, K. Davut, " A Specific Image Processing Code in MatLab to Perform Advanced Nodularity and Nodule Count Analysis of Austempered Ductile Iron", *Microscopy and Microanalysis*, 23 (S1), p.232-233, 2017 |
| **5** | B. Çetin, H. Meco, K. Davut, E. Arslan, M.C. Uzun, "Microstructural Analysis of Austempered Ductile Iron Castings", *Hittite Journal of Science and Engineering*, 3(1), p.29-34, 2016 |
| **6** | G. Karacalı, K. Davut, "EBSD-based Analysis of the Relation between Oxide Scale Microstructure and Pickling Characteristics of a Commercial Hot Rolled Strip", *Microscopy and Microanalysis*, 22(S3), p.1940-1941, 2016 |

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| **7** | K. Davut, S. Zaefferer, " The Reliability of EBSD-based Microstructure Analysis, *Microscopy and Microanalysis*, 21 (S3), p.2029-2030, 2015 |
| **8** | O. Elkoca, K.Davut, "Metallographic Sample Preparation and Characterisation of Oxide Scales on Hot Rolled Steel Strips, *Microscopy and Microanalysis,* 21 (S3), p.2269-2270, 2015 |
| **9** | K. Davut, "Relation between Microstructure and Mechanical Properties of a Low-alloyed TRIP Steel", Shaker Verlag, 2013 |
| **10** | K. Davut, S. Zaefferer, "The effect of size and shape of austenite grains on the mechanical properties of a low alloyed TRIP steel", *Steel Research International*, 83 (6), p.584-589, 2012 |
| **11** | K. Davut, S. Zaefferer, "Improving the Reliability of EBSD-based Texture Analysis by a New Large Area Mapping Technique, *Materials Science Forum*, 702-703, p.566-569, 2012 |
| **12** | K. Davut, C.H. Gür, "Monitoring the microstructural evolution in spheroidized steels by magnetic Barkhausen noise", *Journal of Nondestructive Evaluation*, 29, p.241-247, 2010 |
| **13** | K. Davut, S. Zaefferer, "Statistical reliability of phase fraction determination based on electron backscatter diffraction (EBSD) investigations on the example of an Al-TRIP steel", *Metallurgical and Materials Transactions A*, 41A, p.2187-2196, 2010 |
| **14** | K. Davut, C.H. Gür, "Monitoring the microstructural changes during tempering of quenched SAE 5140 steel by magnetic Barkhausen noise", *Journal of Nondestructive Evaluation*, 26, p.107-113, 2007 |

**PROJECTS**

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| **1** | *Researcher* in TUBITAK MAG106M328, Turkey, Hungary Bilateral Project (2006 - 2008), "Investigating the microstructures of ceramic particle reinforced aluminum matrix composites",<br>***Coordinators***: Prof.Dr. C.Hakan GÜR & Prof.Dr. Zoltan Gacsi |
| **2** | *Researcher* in METU-BAP-2005-07-02-00-89, (2005 - 2006),<br>"Characterization of Microstructure and Determination of Residual Stresses in Steels by Magnetic Barkhausen Noise Technique",<br>***Coordinator:*** Prof.Dr. C.Hakan GÜR |
| **3** | Researcher in DFG - BL402/19-1 & ZA 287/5-1, (2008 - 2011), "The relation between microstructure and damage mechanisms in multi-phase steels",<br>***Coordinators***: Univ.Prof.Dr.-Ing. W. Bleck & P.D.Dr.-Ing. S. Zaefferer |
| **4** | *Researcher* in EU Regional Development Fund, Nordrhein-Westfalen Land (2011-2012), "Hightech NRW Bladestrip – Innovative Werkstoffgeneration für Schneidwaren durch die zukunftsweisende Fertigungstechnologie Bandgiessen",<br>**Coordinators:** Prof.Dr.-Ing. D.Raabe & Dr.-Ing. D.Ponge |
| **5** | *Researcher* in SFB 761 Steel - ab initio (2012 - 2013)<br>Side Project C4 Local and global texture and anisotropy<br>**Coordinators:** Prof.Dr.-Ing. D. Raabe & P.D.Dr.-Ing. S. Zaefferer |
| **6** | *Researcher* in Ministry of Development project, (2012 – 2015),<br>"Establishment of Metal Forming Center of Excellence (Phase 2)"<br>**Coordinators:** Prof.Dr.-Ing. E. Tekkaya & Prof.Dr. B. Kaftanoglu |
| **7** | *Academic Partner* in TÜBİTAK TEYDEB 1501 – (2013 – 2015)<br>Kabartılı Direnç Kaynağında Çapak Oluşumunun Anlaşılması ve Önlenmesi<br>**Coordinator*:*** Ermetal A.Ş. (Dr. Cemil Erhuy) |
| **8** | *Researcher* in SAN-TEZ-0673.STZ.2014, (2015 - 2017)<br>Simulation and Optimization of Carburizing of a Fuel Pump Camshaft<br>**Coordinator:** Assist.Prof.Dr. Caner Simsir |
| **9** | *Scientific Advisor* in SSM-ÖRS, Under-secretariat for Defense Industries (2016-ongoing), "Development of |

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| **10** | *Researcher* in Ministry of Development project, (2016 – 2019),<br>"Establishment of Metal Forming Center of Excellence (Phase 3)"<br>**Coordinator:** Prof.Dr. B. Kaftanoglu |
| **11** | *Researcher* in TÜBİTAK 1001 (2017 – 2019)<br>"Magnezyum Alaşımı Benzeri Bileşiklerin Sinir Kılavuz Kanalı Uygulaması için Elektroeğirme ile Üretimi"<br>**Coordinator:** Assoc.Prof.Dr. Hilal Şaşmazel |

## CONFERENCE PRESENTATIONS

| | |
|---|---|
| **1** | *K.Davut, C.H.Gür, X. Kleber*, **Characterisation of quenched and tempered steels by magnetic Barkhausen noise method,** 9th European Conf. on NDT, Berlin - Germany (2006) |
| **2** | *K.Davut & C.H.Gür*, **Investigating the efficiency of magnetic Barkhausen noise method for determining average grain size of steels,** 6th ICBM, Valenciennes - France (2007) |
| **3** | *K.Davut, S. Bayramoglu, G. Gürer, C.H.Gür*, **Nondestructive characterization of spheroidised AISI 1060 steel by magnetic Barkhausen noise measurements** 6th ICBM, Valenciennes - France (2007) |
| **4** | *K.Davut & C.H.Gür*, **Non-destructive characterization of pearlite spheroidization by MBN method,** 17th World Conf. on NDT , Shanghai - China (2008) |
| **5** | *K.Davut & C.H.Gür*, **Monitoring the microstructural evolution in spheroidised steel by magnetic Barkhausen noise method,** 7th ICBM, Aachen - Germany (2009) |
| **6** | *K.Davut & S.Zaefferer*, **Phase fraction and texture quantification of Al-TRIP steel from EBSD data,** 3rd ITAP, Göttingen - Germany (2009) |
| **7** | *K.Davut & S.Zaefferer*, **Statistical reliability of phase fraction determination based on EBSD investigations on the example of a TRIP steel,** Royal Microscopy Society - EBSD 2010 Meeting, Derby - UK (2010) |
| **8** | *K.Davut & S.Zaefferer*, **Relation between damage nucleation and microstructure in TRIP steels,** DFG Congress MSE-2010, Darmstadt - Germany (2010) |
| **9** | *K.Davut & S.Zaefferer*, **Statistical reliability of EBSD datasets for the characterization of Al-alloyed TRIP steels,** 15th Int. Metallurgy & Materials Congress, Istanbul - Turkey (2010) |
| **10** | *K.Davut & S.Zaefferer*, **The effect of texture on stability of retained austenite in Al-alloyed TRIP steels,** MRS 2010 Fall Meeting, Boston - USA (2010) |
| **11** | *K.Davut & S.Zaefferer*, **A new large-area mapping technique to improve the statistical reliability of EBSD,** Royal Microscopy Society - EBSD 2011 Meeting, Düsseldorf - Germany (2011) |
| **12** | *K.Davut & S.Zaeffer*, **Factors influencing the strain-induced transformation of residual austenite in a low alloyed TRIP steel,** Euromat 2011, Montpellier - France (2011) |
| **13** | *K.Davut & S.Zaefferer*, **Improving the reliability of EBSD-based texture analysis by a new mapping technique,** ICOTOM 16, Mumbai - India (2011) |
| **14** | *K.Davut, T.Demitas, C.Simsir*, **Determination of the Optimum Magnetic Barkhausen Noise Measurement Parameters for Evaluating the Microstructure of Quenched and Tempered AISI 4140 steels,** 17th Int. Metallurgy & Materials Congress, Istanbul - Turkey (2014) |
| **15** | *O.Müstak, K.Davut, C.Simsir, C.H.Gür*, **Determination of Flow Curves of Metastable Austenite,** 17th Int. Metallurgy & Materials Congress, Istanbul - Turkey (2014) |
| **16** | *K.Davut & S.Zaefferer*, **Microstructural Parameters Affecting the Macroscopic Mechanical Response of a low alloyed TRIP steel,** 2nd METFORM, Ankara - Turkey (2014) |
| **17** | *O.Müstak, K.Davut, C.Simsir, C.H.Gür*, **Experimental Investigation of Transformation Plasticity of SAE 52100 Steel,** 2nd METFORM, Ankara - Turkey (2014) |
| **18** | *K.Davut, T.Demitas, C.Simsir*, **The Effect of Measurement Parameters on the** |

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| | **Sensitivity of Magnetic Barkhausen Noise Technique: An Example of Hardness Difference between Quenched and Tempered AISI 4140 Steels,** 2nd METFORM, Ankara - Turkey (2014) |
| **19** | *M.E.Tamer, K.Davut, O.Music, I.Durgun*, **Investigation of Plastic Strains in Incremental Sheet Forming by Hardness Tests,** 2nd METFORM, Ankara - Turkey (2014) |
| **20** | *O.Müstak, K.Davut, C.Simsir, C.H.Gür*, **Determination of Flow Curves of all Microstructural Constituents of SAE 52100 Bearing Steel for Heat Treatment Simulation,** 2nd IFHTSE, Beijing - China (2014) |
| **21** | *D. Çimen, G. Karacalı, O. Elkoca, K. Davut*, **Comparison of Reliability of EBSD and XRD Techniques for Phase Fraction Determination of a TRIP-Steel,** 3rd Int. Multidisciplinary Microscopy and Microanalysis Congress, Mugla - Turkey (2015) |
| **22** | *Y. M. Arısoy, T. Özel, C. Guo, K. Davut, B. Kaftanoglu*, **Modeling of Microstructural Changes due to Machining Process on Nickel Superalloy Surface,** 8th Int.Conf. and Exhibition on Design and Production of Machines and Dies and Molds, Kusadası, Turkey (2015) |
| **23** | *Ö.F. Murathan, V. Kılıçlı, K. Davut*, **Effect of Austempering Heat Treatments on Microstructure and Mechanical Properties of AISI 9254 Commercial Spring Steel,** 2ndInt.Iron and Steel Symposium (IISS'15), Karabük, Turkey (2015) |
| **24** | *E. Arslan, K. Davut, C. Simsir*, **Optimization of Sensitivity and Reliability of Magnetic Barkhausen Technique for Detecting Hardness Differences on Quenched and Tempered AISI 4140 Steels,** 11th Int. Conf. on Barkhausen Noise & Micromagnetic Testing, Kusadası, Turkey (2015) |
| **25** | *V. Kılıçlı, M. Erdogan, K. Davut, Z. Öztürk, C. Simsir*, **Characterization of Microstructure of Austempered Low-alloy White Cast Iron by Magnetic Barkhausen Noise Technique** 11th Int. Conf. on Barkhausen Noise & Micromagnetic Testing, Kusadası, Turkey (2015) |
| **26** | *K. Davut, V. Kılıçlı, Ö.F. Murathan, E. Arslan, C. Simsir*, **Non-destructive Characterization of Prior Austenite Structure of AISI D2 Tool Steel by Magnetic Barkhausen Noise Technique,** 11th Int. Conf. on Barkhausen Noise & Micromagnetic Testing, Kusadası, Turkey (2015) |
| **27** | *E. Tamer, K. Davut, O. Music, I. Durgun*, **Using Barkhausen Noise Technique for the Prediction of Properties of Components Manufactured by Incremental Sheet Forming** 11th Int. Conf. on Barkhausen Noise & Micromagnetic Testing, Kusadası, Turkey (2015) |
| **28** | *K. Davut, Z. Öztürk, C. Simsir*, **Evaluating the Stress State of Steels by Simultaneous X-ray Diffraction and Magnetic Barkhausen Noise Measurements during Four-point Bending Tests,** 11th Int. Conf. on Barkhausen Noise & Micromagnetic Testing, Kusadası, Turkey (2015) |
| **29** | *V. Kilicli, O.F. Murathan, K. Davut*, **Development of Carbide Free Bainite Martensite Duplex Structure in Commercial High Silicon Spring Steel Silicon Spring Steel,** International Conference on Material Science and Technology in Cappadocia (IMSTEC-16) , Nevsehir, Turkey (2016) |
| **30** | *E. Billur, B. Cetin, R.O. Uguz, K. Davut, E. Arslan*, **Advanced Material Characterization of TWIP Steels,** New Developments in Sheet Metal Forming, (NEBU-2016) , Stuttgart, Germany (2016) |
| **31** | *H. Hizli, K. Davut, C. Simsir, C.H. Gur*, **Nondestructive Monitoring of the Variations in Microstructure and Residual Stress in the Carburized Steels,** 19th World Conference on Non-Destructive Testing, Munich, Germany (2016) |
| **32** | *E. Arslan, Ö.F. Murathan, K. Davut, V. Kılıçlı*, **Evaluation of the Microstructure of AISI D2 Steel by Magnetic Barkhausen Noise Technique,** 18th Int. Metallurgy and Materials Congress (IMMC 2016), Istanbul, Turkey (2016) |
| **33** | *B. Yazır Terzi, G.E. Evcil, S. Yıldız, K. Davut, C. Simsir*, **Sensitivity Analysis of Distortion of Carburized Steel Shafts Using Computer Simulations,** 18th Int. Metallurgy and |

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| | Materials Congress (IMMC 2016), Istanbul, Turkey (2016) |
| **34** | *H. Yılmaz, B. Yazır, G.E. Evcil, S. Yıldız, C. Simsir, K. Davut*, **Determination of Factors Influencing Distortion of Carburized Quenching of Steel Shafts Using DoE with Computer Simulations,** 18th Int. Metallurgy and Materials Congress (IMMC 2016), Istanbul, Turkey (2016) |
| **35** | *S. Yıldız, H. Yılmaz, B. Yazır, G.E. Evcil, C. Simsir, K. Davut*, **Determination of Isothermal Austenite Grain Growth Model Parameters for SAE 8620H Carburizing Steel,** 18th Int. Metallurgy and Materials Congress (IMMC 2016), Istanbul, Turkey (2016) |
| **36** | *K. Davut, B. Çetin, E. Arslan, H. Meço, C. Yazganarıkan*, **Nodularity and Nodule Count Analysis of Austempered Ductile Iron Castings by Digital Image Processing,** 18th Int. Metallurgy and Materials Congress (IMMC 2016), Istanbul, Turkey (2016) |
| **37** | *G. Karacali, K. Davut, D. Çimen, Ü. Baskaya*, **EBSD-Based Analysis of Oxide Scales Formed on a Hot Rolled Strip,** 18th Int. Metallurgy and Materials Congress (IMMC 2016), Istanbul, Turkey (2016) |
| **38** | *Ö.F. Murathan, I. Ovalı, V. Kılıçlı, Kemal DAVUT,* **Effect Of Matrix Microstructures On Wear Behavior Of High Silicon Spring Steel,** 16th International Materials Symposium IMSP'2016, Denizli, Turkey (2016) |
| **39** | *B. Çetin, K. Davut, A. Yalçın,* **Östemperlenmiş Sünek Dökme Demir Malzemelerin Savunma Sanayindeki Potansıyeli ve Kısıtları,** IDEFIS 2017 2nd International Defense Industry Symposium, Kırıkklae, Turkey (2017) |
| **40** | *K. Davut, A. Yalçın, B. Çetin,* **Influence of Cu and Ni alloying on the Microstructure and Mechanical Properties of Austempered Ductile Iron Castings,** 8th Int. Advances in Applied Physics and Materials Science Congress (APMAS 2018), Fethiye, Turkey (2018) |
| **41** | *B. Çetin, H. Kurtuldu, G. Durkaya, K. Davut,* **Investigation of the Effect of Auto-Focus and Auto-threshold Algorithms in Advanced Nodularity Analysis of Austempered Ductile Iron Castings,** 8th Int. Advances in Applied Physics and Materials Science Congress (APMAS 2018), Fethiye, Turkey (2018) |

## CITATIONS

| | |
|---|---|
| Sum of times cited without self-citations (ISI Web of Science): | 47 *(06/2018)* |
| H-index (ISI Web of Science): | 4 *(06/2018)* |

## COURSES GIVEN

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|---|---|
| **1** | MATE 415 (*MATE405)* Heat Treatment and Surface Hardening of Materials |
| **2** | MATE 314 (MATE 307) Microstructure and Phase Relations |
| **3** | MATE 207 Introduction to Materials Engineering |
| **4** | MATE 420 Graduation Project |
| **5** | MATE 506 Advanced Microscopy Techniques |

## THESES SUPERVISED

| | |
|---|---|
| **1** | Ebru Arslan, MS Thesis, Nondestructive Characterization of Steel Microstructures by Magnetic Barkhausen Noise Technique, 2017 |
| **2** | Büşra Yazır, MS Thesis, Design and Optimization of Carburized Quenching of Cam-Shaft Using Computational Methods, 2017 (Co-supervisor) |

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| **3** | Hasan Yılmaz, MS Thesis, Design and Optimization of Carburized Quenching of Cam-Shaft Using Industrial Experimental Analysis, 2017 (Co-supervisor) |
| **4** | Seçil Yıldız, MS Thesis, Material Characterization Techniques Applied for Validation of Carburized Quenching Simulations, 2017 |