

CV Alexander F. H. Kaplan

Born in Vienna, Austria, 18/12/1967 (Nationality: Austria);

Chaired Professor of “Manufacturing Systems Engineering” at the Division of “Product and Production Development”, belonging to the Department of Engineering Sciences and Mathematics (TVM) at Luleå University of Technology (LTU)

Homepage of the research group: <http://www.ltu.se/research/subjects/Produktionsutveckling>

A. Professional preparation

Undergraduate university: Vienna University of Technology (Austria)

Subject: Electrical engineering / industrial electronics & control engineering

Degree, Year: *Dipl.-Ing.* (equivalent *civ.-ing.*), 1990 (top 2% in studying duration)

Graduate university: Vienna University of Technology (AT), Dept. of Laser Technology (ISLT)

Subject, Degree, Year: Laser welding, *Dr.techn. (PhD)*, 1994

Postdoc universities: Vienna TU (AT), *Universitätsdozent (Venia Docendi)*, 2000

Postdoc universities: Luleå University of Technology (LTU, Sweden): *Honorary Docent (DSc)*, 2000

Postdoc universities: Osaka University (Japan), Joining and Welding Research Institute (JWRI)

EU post-doc research fellowship (ranking 2 of 21), 2001-2002

Language skills: German (mother tongue), English, French, Swedish (fluently), Japanese (basics)

B. Appointments:

Since 14/01/2002: Full Professor, Chair of Manufacturing Systems Engineering at LTU, Dept. of Engineering Sciences and Mathematics (TVM). Permanent position; Extent of research actually: 20%;

2002-2010: Head of the Division of Manufacturing Systems Engineering (from 2010 on: Division reorganisation, with two Chairs; Chair of Manufacturing; 2018: staff 15, turnover: 14 MSEK)

2006-2010: Vice-chairman (chairman: Prof. Lena Abrahamsson) of the LTU research area “Production and Organisation”

01/03/2001-28/02/2002: Visiting researcher (EU INCO research fellowship) at Osaka U (Japan)

01/02/1996-28/02/2001: Head of group on European projects (ISLT, Vienna TU, Austria)

01/05/1989-28/02/2001: Researcher at ISLT/Vienna TU (AT), full time employment

1988,1989: Industrial trainee (1 month) at Siemens (AT), Kaprun Energy (AT), Nokia (Oulu, FIN)

Parental leave: 2 months for Fabian K. (in Australia, 2006); 2 months for Pascal K. (in Florida, 2007)

C. Supervising (mainly in laser materials processing):

Supervisor of 11 completed PhD-theses; Supervisor of 11 Lic-theses; Co-supervisor of 6 PhD-theses

Actually main supervisor of 5 PhD-students and co-supervisor of 2 PhD-students

D. Networks in academy and industry:

In contact with approximately 100 relevant industrial companies in Sweden (62 in the industrial network “Lasergruppen/Svetskommissionen”), beside others particularly in Europe and Asia.

Academic network with personal contacts to about 80 academic laser processing teams worldwide.

Coordinator of the mathematical modelling working group M4PL from 1991 to 2009, including editor of 16 workshop proceedings; about 40 academic partners from D,F,UK,E,NL,S,A,RUS,B,etc.

Swedish delegate of Commission IV (Power Beam Processes) of the IIW (Internat. Inst. of Welding)

Steering Committee Member (2002-2006): Swedish Laser Network Lasergruppen (60 members) as part of the Swedish Welding Commission/Svetskommissionen (400 companies)

Scientific committee/advisory board member at various recognized conferences: ICALEO, CLEO/EQEC, LIM, LANE, SPS, NOLAMP, etc. Chairman/Coordinator of: NOLAMP (2005, 2013)

Member (since 2006) of the presidium board of SPA, The Swedish Production Academy

Steering Committee Member (2002-2006): Swedish Laser Network Lasergruppen (60 members) as part of the Swedish Welding Commission/Svetskommissionen (400 companies)

Swedish network node of the Nordic laser cooperation platforms (web-sites) NORLAS, SWELAS

Main examiner of PhDs: e.g. Cambridge Univ. (UK, 3x), Chosun Univ. (Korea, 2x, only thesis), Lappeenranta TU (FIN, only thesis), Vienna TU (AT), Vrije U (BE), Aalborg U (DK), Univ. West (SE)

Actual network examples include: Stuttgart U: Prof. Th. Graf, Cambridge U: Prof. W. O'Neill, Chosun U (KOR): Prof. H-S Bang, Twente U (NL): Prof. G.W. Römer, Prof. M. Vedani, Poli. Milano

E. Merits and other information of relevance

H-index: 24, 2300 times cited; Published manuscripts totally 304 (April 2020): 139 in scientific journals, 9 in books, 153 in peer-reviewed proceedings, 3 theses; plus editor of 22 proceedings;

Main grant holder for manifold European and national research projects.

Honorary Professor at Changchun University of Technology, China (appointed in 2003)

Jacob Wallenberg Foundation Award (2011, promoters: IVA, SKF) in Materials Science, 100 tkr

Manager of the post graduate course EuroLaser Academy, 30-100 graduates/year, 1996-2000

Development of sophisticated semi-analytical mathematical models and resulting analysis on

- laser welding of various kinds (e.g. in cooperation with Osaka University, Japan)
- laser additive manufacturing (SLM, LMD, e.g. with Siemens Turbomachinery, Finspång)
- laser surface treatment (cladding, impregnation, alloying, hardening/metallurgy)
- laser cutting (inert gas cutting, oxygen cutting, remote fusion cutting)
- laser micromachining (in cooperation with Russian Academy of Sciences, Moscow)
- laser-matter interaction (absorption mechanism, laser beam shape)

by an own mathematical approach (semi-analytical modelling) that enables flexibility to take into account individual mathematical models for each relevant physical mechanism involved, in particular interaction zone geometry, absorption, thermodynamics, fluidmechanics, plasma formation, chemistry, metallurgy, stress formation, etc.

Development of virtual tools (CD-ROMs with interactive user-interfaces):

- ELANET: modelling/simulation software and user interface for laser processing
- DELTA: virtual teaching curriculum for lasers and laser processing (15 CD-ROMs)
- VIRTUELA: development of an interactive virtual laser laboratory (full curriculum)

and of advanced web-conferencing methods

- CyberLab and ProCyCo: Remote lab experiments by interactive web-conferencing, CyberCafé for cooperation between Luleå TU, Cambridge U, Paris ENSAM, Stuttgart U

by coordinating corresponding EU-projects (6-25 partners each).

Development of an "Agenda for the Industrial Future" for technology implementation in companies, particularly SMEs, including a guideline to connect to the company vision, strategy, customer goals.

Development of the CYCLAM technique; recycling of waste by laser to feed additive manufacturing

F. Examples of Publications (Alexander F. H. Kaplan)**JOURNALS (AUTHOR)**

1. Kaplan, A.: A model of deep penetration laser welding based on calculation of the keyhole profile, *Journal of Physics D: Applied Physics*, v 27, pp 1805-1814 (1994).
2. Kaplan, A. F. H.: An analytical model of metal cutting with a laser beam, *Journal of Applied Physics*, v 79, n 5, pp 2198-2208 (1996).
3. Kaplan, A. F. H. and O. Wangler: On-line Qualitätsüberwachung beim Laserschneiden (in German), *Laser und Optoelektronik*, v 28, n 3, pp 68-74 (1996).
4. Kaplan, A. F. H., O. Wangler and D. Schuöcker: Laser cutting: fundamentals of the periodic striations and their on-line detection, *Lasers in Engineering*, v 6, pp 103-126 (1996).
5. Kaplan, A. F. H.: Surface processing by non-Gaussian beams, *Applied Physics Letters*, v 70, n 2, pp 264-266 (1997).
6. Kaplan, A. F. H., G. Liedl, J. Zimmermann and D. Schuöcker: Laser dispersing of TiC-powder into Al-substrates, *Lasers in Engineering*, v 7, n 3-4, pp 165-178 (1998).
7. Kaplan, A. F. H., J. Zimmermann, D. Schuöcker: Combined laser welding, cutting and scribing, *CIRP - Journal of Manufacturing Systems*, v 28, n 2, pp 157-162 (1999).
8. Kaplan, A. F. H. and G. Groboth: Process analysis of laser beam cladding, *Transactions of the ASME: Journal of Manufacturing Science and Engineering*, v 123, pp 609-614 (November 2001).
9. Kaplan, A. F. H., M. Mizutani, S. Katayama and A. Matsunawa: Unbounded keyhole collapse and bubble formation during pulsed laser interaction with liquid zinc, *Journal of Physics D: Applied Physics*, v 35, pp 1218-1228 (2002).
10. Kaplan, A. F. H., M. Mizutani, S. Katayama and A. Matsunawa: Analysis of different methods for the prevention of pore formation in keyhole laser spot welding, *Welding in the World*, v 46, pp 39-50 (2002).
11. Kaplan, A. F. H.: Model of the absorption variation during pulsed laser heating applied to welding of electronic Au/Ni-coated Cu-leadframes, *Applied Surface Science*, v 241, n 3-4, pp 362-370 (2005).
12. Kaplan, A. F. H. and G. Wiklund: Advanced welding analysis methods applied to heavy section welding with a 15 kW fibre laser, *Welding in the World*, v 53, pp 295-300 (2009).
13. Kaplan, A., J. Powell, H. Gedda: Laser:powder:substrate interactions in laser cladding and casting, *International Journal of Microstructure and Materials Properties*, v 5, n 2-3, pp 164-177 (2010).
14. Kaplan, A. F. H.: Analysis and modeling of a high power Yb:fibre laser beam, *Optical Engineering*, v 50, n 5, p 054201 (3 p) (2011).
15. Kaplan, A. F. H and J. Powell: Spatter in laser welding, *J Laser Appl.*, v 32, n 3, 032005 (7 p) (2011). doi:10.2351/1.3597830
16. Kaplan, A. F. H.: Comparison of beam profiles for keyhole modelling of laser welding, *Journal of Laser Applications*, v 23, pp 042005 (9 p) (2011).
17. Kaplan, A. F. H.: Local absorptivity modulation of a 1 μm -laser beam through surface waviness, *Applied Surface Science*, v 258, n 8, pp 9732-9736 (2012).
18. Kaplan, A. F. H.: Fresnel absorption of 1 μm - and 10 μm -laser beams at the keyhole wall during laser beam welding: Comparison between smooth and wavy surfaces, *Applied Surface Science*, v 258, n 8, 3354-3363 (2012).
19. Kaplan, A. F. H.: Absorptivity modulation on wavy molten steel surfaces; the influence of laser wavelength and angle of incidence, *Applied Physics Letters*, v 101, pp 151605 (4 p) (2012). doi: 10.1063/1.4759126
20. Kaplan, A. F. H.: Laser absorptivity on wavy molten metal surfaces: Categorization of different metals and wavelengths, *J. Laser Appl.*, v 26, pp 012007 (9 p) (2014).

21. Kaplan, A. F. H., J. Frostevarg and J. Powell: A procedure to fully control and trace the weld quality for laser-arc hybrid welding under production conditions, *Int. J. Manufacturing Research*, v 9, n 1, pp 92-111 (2014).
22. Kaplan, A. F. H and R. S. Matti: Absorption peaks depending on topology of the keyhole and wavelength, *Journal of Laser Applications*, v 27, S2, S29012 (2015).
23. Kaplan, A. F. H.: Absorption homogenization at wavy melt films by CO₂-lasers in contrast to 1 micron-wavelength lasers, *Applied Surface Sciences*, v 328, pp 229-234 (2015).
24. Kaplan, A. F. H.: Local flashing events at the keyhole front in laser welding, *Optics and Lasers in Engineering*, v 68, pp 35-41 (2015).
25. Kaplan, A. F. H., K.-H. Kim, H.-S. Bang, H.-S. Bang, J. Näsström and J. Frostevarg: Narrow gap laser welding by multilayer hot wire addition, *Journal of Laser Appl.*, v 28, n 2, pp 022410 (2016).
26. Kaplan, A. F. H., M. Höfemann, E. Vaamonde, A. Ramasamy, B. Kalfsbeek, J. Näsström, S. M. Robertson, J. Frostevarg, J. Volpp: Microstructures from wire-fed laser welding of high strength steel grades, *Journal of Laser Applications* (in press) (2020).

JOURNALS (CO-AUTHOR)

27. Weingartner, W., A. Kaplan and D. Schuöcker: Laser machining with melt removal through suction, *International Journal of Materials and Product Technology*, v 11, n 3/4, pp 310-319 (1996).
28. Liedl, G., K. Schröder and A. Kaplan: Excimer laser processing of video heads, *Applied Surface Science*, v 106, pp 374-378 (1996).
29. Baeva, M., P. Baev, A. Kaplan: An analysis of the heat transfer from a moving elliptical cylinder, *Journal of Physics D: Applied Physics*, v 30, n 8, pp 1190-1196 (1997).
30. Lampa, C., A. F. H. Kaplan, J. Powell and C. Magnusson: An analytical thermodynamic model of laser welding, *Journal of Physics D: Applied Physics*, v 30, pp 1293-1299 (1997).
31. Resch, M. and A. F. H. Kaplan: Heat conduction modelling of laser welding, *Lasers in Engineering*, v 7, n 3-4, pp 229-240 (1998).
32. Lampa, C., A. F. H. Kaplan, M. Resch and C. Magnusson: Fluid flow and resolidification in deep penetration laser welding, *Lasers in Engineering*, v 7, n 3-4, pp 241-253 (1998).
33. Tokarev, V. N. and A. F. H. Kaplan: Modelling of melt depth in wide range of laser pulse intensities, *Lasers in Engineering*, v 7, n 3-4, pp 295-332 (1998).
34. Tokarev, V. and A. F. H. Kaplan: Modeling of time dependent pulsed laser melting, *Journal of Applied Physics*, v 86, n 5, pp 2836-2846 (1999).
35. Tokarev, V. and A. F. H. Kaplan: Suppression of melt flows in laser ablation: Application to clean laser processing, *Journal of Physics D: Applied Physics*, v 32, n 13, pp 1526-1538 (1999).
36. Forsman, T., J. Powell, C. Lampa, A. F. H. Kaplan and C. Magnusson: Nd:YAG laser welding of aluminium; factors affecting absorptivity, *Lasers in Engineering*, v 8, n 4, pp 295-310 (1999).
37. Forsman, T., A. F. H. Kaplan, J. Powell and C. Magnusson: Initiation and termination phenomena in laser welding of aluminium, *Journal of Laser Applications*, v 12, n 2, pp 81-84 (2000).
38. Koruk, A. I., I. Hrivnak and A. Kaplan: Laserové zvaranie prístrojov karosárskych plechov (in Slovakian), *Zvaranie-Svarování* (Welding, Slovakia) v 49, n 3, pp 56-60 (2000).
39. Lampa, C., A. F. H. Kaplan, J. Powell and C. Magnusson: The effect of process speed on energy redistribution in deep penetration CO₂ laser welding, *International Journal of High Temperature Materials Processing*, v 4, pp 213-225 (2000).
40. Gedda, H., J. Powell, A. Kaplan: A process efficiency comparison of Nd:YAG and CO₂ laser cladding, *Welding in the World*, v 46, pp 75-86 (2002).

41. Gedda, H., A. Kaplan, J. Powell, K. Rustig: Laser wire casting, *Powder metallurgy*, v 46, n 3, pp 199-201 (2003).
42. Chen, Y., C.H. Gan, L.X. Wang, G. Yu, A. Kaplan: Laser surface modified ductile iron by pulsed Nd:YAG laser beam with two-dimensional array distribution, *Applied Surface Science*, v 2456, n 1-4, pp 316-321 (2005).
43. Gedda, H., A. F. H. Kaplan, J. Powell: Melt-solid interactions in laser cladding and laser casting, *Metallurgical and Materials Transactions B*, v 36B, pp 683-689 (2005).
44. Chen, Y., C. H. Gan, Z. Tainua, G. Yu, P. Bai, A. Kaplan: Laser-surface-alloyed carbon nanotubes reinforced hydroxyapatite composite coatings, *Applied Physics Letters*, v 86, n 25, pp 251905-251913, (2005).
45. Norman, P., M. Bäckström, K. Tatar, M. Rantalo, A. Svoboda, A. F. H. Kaplan: A sophisticated platform for characterization, monitoring and control of machining, *Measurement Science and Technology*, v 17, n 4, pp 847-854 (2006).
46. Yao, Y., M. Wouters, J. Powell, K. Nilsson, A. F. H. Kaplan: The influence of joint geometry and fit-up gaps on hybrid laser-MIG welding, *Journal of Laser Applications*, v 18, n 4, pp 283-288 (2006).
47. Wouters, M., J. Powell, A. F. H. Kaplan: The influence of the joint gap on the strength of hybrid Nd:YAG laser-MIG welds, *Journal of Laser Applications*, v 18, n 3, pp 181-184 (2006).
48. Koh, Y.S., J. Powell, A. F. H. Kaplan: The removal of layers of corrosion from steel surfaces: a comparison of laser methods and mechanical techniques, *Journal of Laser Applications*, v 19, n 2, p 99-106 (2007).
49. Norman, P., A. F. H. Kaplan, M. Rantatalo, I. Svenningsson: Study of a sensor platform for monitoring machining of aluminium and steel, *Measurement Science and Technology*, v 18, n 5, pp 1155-1166 (2007).
50. Bergström, D., J. Powell, A. F. H. Kaplan: The absorptance of non-ferrous alloys to Nd:YLF and Nd:YAG laser light at room temperature, *Applied Optics*, v 46, n 8, 1290-1301 (2007).
51. Bergström, D., J. Powell, A. F. H. Kaplan: The absorptance of steels to Nd:YLF and Nd:YAG laser light at room temperature, *Applied Surface Science*, v 253, pp 5017-5028 (2007).
52. Bergström, D., J. Powell, A. F. H. Kaplan: Light scattering and absorption in Gaussian random rough metal surfaces using the geometric optics approximation, *Journal of Applied Physics*, v 101, n 11, e-p 113540 (11 p) (2007).
53. Song, H.-W., G. Yu, A. F. H. Kaplan, J.-S. Tan, X-L Yu: Thermal fatigue on pistons induced by shaped high power laser – Part II: Design of spatial intensity distribution via numerical simulation, *International Journal of Heat and Mass Transfer*, v 51, n 3-4, pp 768-778 (2008).
54. Norman, P., H. Engström, A. F. H. Kaplan: Theoretical analysis of photodiode monitoring of laser welding defects by imaging combined with modelling, *J. Phys. D: Appl. Phys.* v 41, p 195502 (e-9pp) (2008)
55. Bergström, D., J. Powell, A. F. H. Kaplan: The absorption of light on rough metal surfaces – a three-dimensional ray-tracing analysis, *Journal of Applied Physics*, v 103, n 10, p 103515 (12 p) (2008).
56. Ilar, T., J. Powell, A. F. H. Kaplan: Simulation of production lines involving unreliable machines: the importance of machine position and breakdown statistics, *International Journal of Simulation Modelling*, v 7, n 4, p 176-185 (2008).
57. Ilar, T., J. Powell, A. Kaplan: Modelling, simulation and analyses of systems with breakdown imposed scrapping, *Journal of Simulation*, v 3, n 2, p 107-113 (2009).
58. Powell, J., D. Petring, R.V. Kumar, S.O. Al-Mashikhi, A. F. H. Kaplan and K.T. Voisey: Laser-oxygen cutting of mild steel: the thermodynamics of the oxidation reaction, *J. Phys. D: Appl. Phys.*, v 42, pp 015504 (e-11pp) (2009).
59. Amer, E., P. Gren, A. F. H. Kaplan, M. Sjö Dahl: Impact of an extended source in laser ablation using pulsed digital holographic interferometry and modelling, *Applied Surface Science*, v 255, p 8917-8925 (2009)

60. Alam, M.M., Barsoum, Z., Jonsén, P., Häggblad, H. A., Kaplan, A.: The Influence of Surface Geometry and Topography on The Fatigue Cracking Behaviour of Laser Hybrid Welded Eccentric Fillet Joints, *Applied Surface Science*, v 265, n 6, pp 1936-1945 (2010).
61. Amer, E., P. Gren, A. F. H. Kaplan, M. Sjö Dahl, M. El Shaer: Comparison of the laser ablation process on Zn and Ti using pulsed digital holographic interferometry, *Applied Surf Sci*, v 256, n 14, pp 4633-4641 (2010).
62. Eriksson, I., J. Powell, A. F. H. Kaplan: Signal overlap in the monitoring of laser welding, *Meas Sci Tech*, v 21, 105705 (7pp) (2010).
63. Eriksson, I., J. Powell, P. Gren, A. F. H. Kaplan: New high-speed photography technique for observation of fluid flow in laser welding, *Optical Engineering*, v 49, n 10, 100503-1-3 (2010).
64. Alam, M. M., J. Karlsson, A. F. H. Kaplan: Generalising fatigue stress analysis of different laser weld geometries, *Materials and Design*, v 32, pp 1814-1823 (2011).
65. Alam, M. M., Z. Barsoum, P. Jonsén, A. F. H. Kaplan, H. Å. Häggblad: Influence of defects on fatigue crack propagation in laser hybrid welded eccentric fillet joint, *Fracture Mechanics*, v 78, pp 2246-2258 (2011).
66. Karlsson, J., A. F. H. Kaplan: Analysis of a fibre laser welding case study, utilising a matrix flow chart, *Applied Surface Science*, v 257, n 9, pp 4113-4122 (2011).
67. Karlsson, J., P. Norman, J. Lamas, A. Yañez, A. F. H. Kaplan: Observation of the mechanisms causing two kinds of undercuts during laser hybrid arc welding, *Applied Surface Science*, v 257, pp 7501-7506 (2011).
68. Olsson, R., I. Eriksson, J. Powell, A. V. Langtry, A.F.H. Kaplan: Challenges to the Interpretation of the Electromagnetic Feedback from Laser Welding, *Optics and Lasers in Engineering*, v 49, pp 188-194 (2011).
69. Olsson, R., I. Eriksson, J. Powell and A.F.H. Kaplan: Advances in pulsed laser weld monitoring by the statistical analysis of reflected light, *Optics and Lasers in Engineering*, v 49, n 11, pp 1352-1359 (2011).
70. Eriksson, I., J. Powell, A. F. H. Kaplan: Measurements of fluid flow inside laser welding keyholes, *Sci. Techn. Weld. Join.*, v 16, n 7, pp 636-641 (2011).
71. Powell, J., S.O. Al-Mashikhi, A.F.H. Kaplan and K.T. Voisey: Fibre laser cutting of thin section mild steel; an explanation of the 'striation free' effect, *Optics and Lasers in Engineering*, v 49, pp 1069-1075 (2011).
72. Al-Mashikhi, S. O., J. Powell, A. Kaplan and K. T. Voisey: Heat affected zones and oxidation marks in fiber laser-oxygen cutting of mild steel, *J. Laser Appl.* v 23, 042003 (2011); doi:10.2351/1.3614404 (7 pages)
73. Eriksson, I., P. Haglund, J. Powell, M. Sjö Dahl, A. F. H. Kaplan: Holographic measurement of thermal distortion during laser spot welding, *Optical Engineering Letters*, v 51, 030501 (3 p) (2012). DOI:10.1117/1.OE.51.3.030501
74. Sokolov, M. S., A. Salminen, A. F. H. Kaplan: Laser Welding of Structural Steels: Influence of the Edge Roughness Level, *Optics & Laser Technology*, v 44, pp 2064-2071 (2012).
75. Lamas, J., J. Karlsson, P. Norman, J. Powell, A.F.H. Kaplan, A. Yañez: The effect of fit-up geometry on melt flow and weld quality in laser hybrid welding, *Journal of Laser Applications*, v 25, n 3, 032010 (7 p) (2013); doi: 10.2351/1.4799556
76. Alam, M. M., A. F. H. Kaplan, J. Tuominen, P. Vuoristo, J. Miettinen, J. Poutala, J. Näkki, J. Junkala, T. Peltola, Z. Barsoum: Analysis of the stress raising action of flaws in laser clad deposits, *Mater Des* v 46, pp 328-337 (2013).
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78. Moradi, M., M. Ghoreishi, J. Frostevarg, A. F. H. Kaplan: An investigation on stability of laser hybrid arc welding, *Optics and Lasers in Engineering*, v 51, pp 481-487 (2013).
79. Eriksson, I., J. Powell, A. F. H. Kaplan: Melt behavior on the keyhole front during high speed laser welding, *Optics and Lasers in Engineering*, v 51, n 6, pp 735-739 (2013).

80. Matti, R. S., T. Ilar and A. F. H. Kaplan: Analysis of laser remote fusion cutting based on a mathematical model, *J. Appl. Phys.*, v 114, pp 233107-9 (2013).
81. Haglund, P., I. Eriksson, J. Powell, A. F. H. Kaplan: Surface tension stabilized laser welding (donut laser welding) A new laser welding technique, *Journal of Laser Applications*, v 25, n 3, 031501 (2 p) (2013).
82. Wiklund, G, O. Akselsen, A. J. Soegjerd and A. F. H. Kaplan: Geometrical aspects of hot-cracks in laser hybrid arc welding, *Journal of Laser Applications*, v 26, pp 012003 (6 p) (2014).
83. Eriksson, I., J. Powell, A. F. H. Kaplan: Surface tension generated defects in full penetration laser keyhole welding, *J. Laser Appl.*, v 26, pp 012006 (6 p) (2014). doi: 10.2351/1.4830175
84. Frostevarg, J., A. F. H. Kaplan and J. Lamas: Comparison of CMT with other arc modes for laser arc hybrid welding of 7 mm steel, *Welding in the World*, v 58, n 5, pp 649-660 (2014).
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88. Matti, R. S. and A. F. H. Kaplan: Analysis of moving surface structures at a laser-induced boiling front, *Applied Surface Science*, v 317, pp 560-567 (2014).
89. Sundqvist, J., A. F. H. Kaplan, J. Granström, K.-G. Sundin, M. Keskitalo, K. Mäntyjärvi, X. Ren: Identifying residual stresses in laser welds by fatigue crack growth acceleration measurement, *Journal of Laser Applications*, v 27, n 4, pp 042002 (8 p) (2014).
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92. Tuominen, J., Näkki, J., Poutala, J., Miettinen, J., Peltola, T., Vuoristo, P., Rasehorn, I., Alam, M.M., Kaplan, A.F.H.: Fatigue behavior of laser clad round steel bars, *Journal of Laser Applications*, v 27, n 1, 012006 (2015).
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94. Sundqvist, J., A. F. H. Kaplan, Ch. Y. Kong, E. Assuncao, L. Coutinho and J. Blackburn: Numerical sensitivity analysis of single pulse laser welding with a C-shaped beam, *Journal of Laser Applications*, v 27, n 4, 042002 (2015).
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97. Lamas, J., J. Frostevarg and A.F.H. Kaplan: Gap bridging for two modes of laser arc hybrid welding, *Journal of Materials Processing Technology*, v 224, pp 73-797 (2015).
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