NOLAMP 17 • the 17th Nordic Laser Material Processing Conference
August 27-29 • 2019
Quality Hotel Augustin • Trondheim • Norway

Tuesday August 27th, 2019 (Day 1)

8:00 – 09:00 Registration

09:00 – 09:20 Welcome and opening (O.M. Akselsen and M. Eriksson, SINTEF, Norway)

09:20 – 09:50 Keynote: E39 Fjord crossings – possible use of laser- and laser-hybrid welding for production of large steel bridge structures (**C. Dørum**, Statens vegvesen, Norway)

09:50 – 10:10 Coffee break

10:10 – 12:00 **Process monitoring in laser beam welding** (Chair: J. Frostevarg, Luleå Univ. of Tech., Sweden)

- Vision based beam offset detection in laser stake welding of T-joints using a neural network (**Y. Mi**, University West, Sweden)
- Quality inspection system for robotic laser welding of double-curved geometries (**A. Mikkelstrup**, Aalborg University, Denmark)
- Improving process reliability by means of detection of weld seam irregularities in copper via thermographic process monitoring (**K. Schaumberger**, Bavarian Laser Centre GmbH, Germany)
- Beam offset detection in laser stake welding of tee joints based on photodetector sensing (**F. Sikström**, University West, Sweden)
- A study on change point detection methods applied to beam offset detection in laser welding (**M. Nilsen**, University West, Sweden)

12:00 – 13:00 Lunch

13:00 – 14:50 **Additive manufacturing 1** (Chair: A.F.H. Kaplan, Luleå Univ. of Technology, Sweden)

- Effective parameters on the fatigue life of metals processed by powder bed fusion technique: A short review (**S. Afkhami**, Lappeenranta University of Technology, Finland**)**
- An experimental and numerical investigation of a novel laser 3D printed sandwich material for motorsport application (**A.W. Alshaer**, University of Central Lancashire, UK)
- The emergence of inhomogeneity in the chemical composition of powder applicable for manufacturing products by additive technologies (**A. Zhukov**, CRISM "Prometey", Russia)
- Powder particle movement during Powder Bed Fusion (**J. Volpp**, Luleå University of Technology, Sweden)
- Effect of high porosity on bending fatigue properties of 3D printed AISI 316L Steel (**M. Jaskari**, Oulu University, Finland)

14:50 – 15:10 Coffee break

15:10 – 17:10 **Laser/laser-arc welding** (Chair: J. Andersson, University West, Sweden)

- Porosity and solidification cracking in fiber laser-MAG welding of 45 mm HSLA steel (**I. Bunaziv**, SINTEF, Norway)
- Mechanical Properties of Single-pass Hybrid Laser Arc Welded 25 mm Thick-walled Structures Made of Fine-grained Structural Steel (**O. Ustundag**, BAM, Germany)
- Application of LBW and LAHW for fillet welds of 12 and 15 mm structural steel (**I. Bunaziv**, SINTEF Norway)
- Tensile and fatigue properties of laser-welded ultra-high-strength stainless spring steel lap joints (**M. Hietala**, Oulu University, Finland)
- Effect of laser beam welding on the cyclic material behavior of the press-hardened martensitic chromium steel X46Cr13 (**B. Möller**, Fraunhofer LBF, Germany)
- Microstructural effects of controlled dilution of high strength steel wire into S960QL (**S. Robertson**, Luleå University of Technology)

19:00 – 19:20 Free organ concert (Nidaros cathedral)
19:30 – 20:30 Light meal at To Tårn

Wednesday August 28th, 2019 (Day 2)

9:00 – 9:30 Keynote: Industrialization of additive manufacturing: ongoing development and key challenges (**K. Boivie**, SINTEF Manufacturing)

09:30 – 10:30 **Laser welding** (Chair: A. Salminen, Lappeenranta University of Technology, Finland)

- Microstructure and mechanical properties of laser-welded high-strength AISI 301LN steel in reversion-treated and temper-rolled conditions (**A. Järvenpää**, Oulu University, Finland)
- The normal and shear strength properties of laser lap weld (**M. Keskitalo**, Oulu University, Finland)
- Influence of Welding Parameters on the Mechanical Properties of a Laser-Welded Joint (**J. Siltanen**, SSAB Europe, Finland)

10:30 – 10:50 Coffee break

10:50 – 12:00 **Industrial presentations** (Chair: O. Akselsen, SINTEF, Norway)

- New possibilities in welding of copper with blue diode lasers (**T. Molitor,** LASERLINE, Germany)
- Spatter formation during Selective Laser Melting: a review (**T. Fedina**, Luleå University of Technology, Sweden)
- Additive manufacturing of aluminum: a review (**A. Da Silva**, Luleå University of Technology, Swden)

12:00 – 13:00 Lunch

13:00 – 14:40 **Material response on laser treatment** (Chair: M. Kristiansen, Aalborg University, Denmark)

- Microstructure morphology characterization of welding consumables studied by pulse-shaped laser heating (**A.F.H. Kaplan**, Luleå University of Technology, Sweden)
- Investigation of the Profile of Laser Bends with Variable Scan Distance (**M. Kristiansen**, Aalborg University, Denmark)
- High power GHz femtosecond laser for ablation efficiency increase (**J. Wolters**, Amplitude Laser Group, France)
- High-speed imaging of droplet behavior during the CYCLAM drop-deposition technique (**J. Sundqvist**, Luleå University of Technology, Sweden)
- Laser welding of dissimilar copper and aluminum sheets by shaping the laser pulses (**K. Mathivanan**, University of Luxembourg, Luxembourg)

14:40 – 15:00 Coffee break

15:00 – 17:00 **Additive manufacturing 2** (Chair: H. Piili, Lappeenranta University of Technology, Finland)

- Research of technological possibility of increasing erosion resistance rotor blade using laser cladding (**M. Kuznetsov**, Saint-Petersburg State Marine Technical University, Russia)
- Effect of process parameters on the formation of single track in pulsed laser powder bed fusion (**V. Laitinen**, Lappeenranta University of Technology, Finland)
- Influence of the vapour channel on processing in laser powder bed fusion (**J. Frostevarg**, Luleå University of Technology, Sweden)
- Laser welding of AlSi10Mg aluminium-based alloy produced by Selective Laser Melting (SLM) (**J. Mäkikangas**, Oulu University, Finland)
- Disk laser assisted surface heat treatments of AlSi10Mg parts produced by selective laser melting (SLM) (**T. Rautio**, Oulu University, Finland)

18:30 Bus transport to Stjørdal
19:00 Dinner at Ersgård (bus transport back to the conference hotel after dinner)

Thursday August 29th, 2019 (Day 3)

09:00 – 10:00 **Additive manufacturing 3** (Chair: R. Pederson, University West, Sweden)

- Stress distribution in laser metal deposited multi-layer thick-walled parts of Ti-6Al-4V (**S. Ivanov**, Saint-Petersburg State Marine Technical University, Russia)
- Microstructure and Mechanical Properties of Laser Metal Deposited Cold-Resistant Steel for Arctic Application (**O. Klimova-Korsmik**, Saint-Petersburg State Marine Technical University, Russia)
- Microstructure of Inconel 718 parts with constant mass energy input manufactured with direct energy deposition (**T. Petrat**, Fraunhofer IPK, Germany)

10:00 – 10:20 Coffee break

10:20 – 11:20 **Industrial presentations** (Chair: O.M. Akselsen, SINTEF, Norway)

- Experimental simulation of microstructure development of laser-based heat treatment (**J. Volpp**, Luleå University of Technology, Sweden)
- Learning and pedagogy of additive manufacturing and 3D printing – developing skills for 21st century industries (**H. Piili**, Lappeenranta University of Technology, Finland)
- Material needs of Finnish metal and mechanical engineering industry from the perspective of additive manufacturing (**M. Korpela**, Lappeenranta University of Technology, Finland)

11:20 -11:40 Presentation of next NOLAMP conference

11:40 – 11:50 Closing of conference

12.00 – 13.00 Lunch