

2017年9月7日(木)

複合材成形のためのプリンティング研究会

第4回複合材成形のためのプリンティングに関するワークショップ



ICCM21における複合材3Dプリントの動向 (Additive manufacturingセッションの概要報告)

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ICCMとは？

ICCM : International Conference on Composite Materials (複合材料に関する世界会議)

2年に一回, 世界各国で開催.



- ICCM21 (2017年8月20日～8月25日) 中国(西安)
- ICCM20 (2015年7月19日～7月24日) デンマーク(コペンハーゲン)
- ICCM19 (2013年7月28日～8月2日) カナダ(モントリオール)
- ICCM18 (2011年8月21日～8月26日) 韓国(チェジュ島)
- ICCM17 (2009年7月27日～7月31日) スコットランド(エディンバラ)
- ICCM16 (2007年7月 8日～7月13日) 日本(京都)

次回 : 2019年 ICCM22 オーストラリア(メルボルン)

次々回 : 2021年 ICCM23 北アイルランド(ベルファスト)

会場の様子



開会式の様子



概要

- 10のPlenary lecture
- 24のKeynote lecture
- 7テーマを更に62トラックに分割して, 22部屋でのパラレルセッション.
- 口頭発表は929件, ポスター発表は221件.
- 参加者数は1700名程度.
- Additive manufacturingトラックの講演数は15. 但し, 他のセッションにて3Dプリントに関する講演が幾つかあった.

Sponsorship & Exhibition



Additive manufacturingセッションの様子



Additive manufacturingセッションの講演題目一覧(その1)

Additive manufacturing 1

- Failure mechanisms of instability-assisted 3D printed Mmcrostructured fibers (The Polytechnique Motreal)
- A novel method for fabricating C/C-SiC composites via 3D printing technology (Huazhong University of Science and Technology)
- The influence of consolidation force on the performance of AFP manufactured laminates (UNSW Australia, et. al.)
- Manufacturing and recycling of 3D printed continuous carbon fiber reinforced PLA composites (Xi'an Jiatong University)

Additive manufacturing 2

- Temperature control continuous carbon fibre reinforced thermoplastic composites by 3D printing (Beihang University, et. al.)
- Influence of parameters on mechanical properties of thermoplastic polymers obtained by fused filament fabrication (Ecole Nationale Superieur d'Art et Metiers)
- 3D printing of continuous fibre reinforced thermoplastic composites (The University of Nottingham)
- Construction of 3D print of glass composite material using light-curing resin and evaluation of mechanical properties (Tokyo University of Science)

Additive manufacturingセッションの講演題目一覧(その2)

Additive manufacturing 3

- Optimizing mechanical properties of additively manufactured FRPC (University of Kaiserslautern)
- 3D printed composites – benchmarking the state-of-the-art – (University of Bristol)
- On a few additional considerations for applying density-type topology optimization to the case of additive manufacturing of fiber reinforced composites (Chiba Institute of Technology)

Additive manufacturing 4

- Preparation and properties of SLA and FDM 3D printed polymer nanocomposites (Chinese Academy of Sciences)
- Innovative process chain for the production of fiber-reinforced functional components based on sandwich structures by Additive Manufacturing (Fraunhofer IWES)
- Three-dimensional printing of continuous carbon fiber reinforced thermoplastics by in-nozzle impregnation with compaction roller (Nihon University, et. al.)
- 3D printing of integrated composite honeycomb sandwich structures with continuous carbon fiber (Tokyo University of Science)

Additive manufacturingセッション以外での関連講演(その1)

- Design and optimization method for 3D printed carbon reinforced aircraft components (Netherlands Aerospace Center, et. al.)
- 4D printing of poly(Lactic acid)-based shape memory polymers and shape memory nanocomposites (Harbin Institute of Technology)
- Thermal residual stresses in thick composite (Concordia University), (4D printing)
- Design and manufacturing of shape changing structures and devices using hybrid 3D printing (Georgia Institute of Technology)
- 3D printed biodegradable shape memory polymer stimulated both electrically and magnetically (National Center for Nanoscience and Technology)
- Dynamic compressive response of 3D printed thermoplastic polyurethane honeycombs with graded densities (University of Bath)
- A novel method for fabricating carbon fibre reinforced silicon carbide composites via 3d printing technology
- Additively manufactured composite with self sensing fiber reinforcement
- Process simulation of 3D printed CFRTP Composites: Heat Transfer and Resin Flow
- Multiscale additive manufacturing simulation solution: from material engineering to confident lightweight design

Additive manufacturingセッション以外での関連講演(その2)

- Development of improved fibre reinforced feedstocks for high performance 3D printing
- Buckling analysis of variable angle tow composite plates with one circular delamination (Cardiff University, et. al.)
- Laminate with under-over lacing made by automated fiber placement (Concordia University)
- Ply interface angles to promote automated forming of aerospace structures (Univesrity of Bath)
- Effect of manufacturing parameters on the quality of thermoplastic composites made by automated fiber placement (AFP) (Concordia Univesrity)
- Advanced automated tape laying with fibre steering capability using continuous tow shearing mechanism (University of Bristol)

以上の中から, FRPの3Dプリントに関連する内容を紹介する.