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Employment

Academic Staff

Chair of Lightweight System Engineering and Multi-Material Design
Technische Universität Dresden
2 Jul 2023 → present

Research outputs

New design for lightweight load introduction elements supported by spider web reinforcement in FRP sandwich structures: Structural behavior analysis using a combined virtual physical building block approach

Kunze, E., Franz, M., Luft, R., Spitzer, S., Wartzack, S. & Gude, M., Sept 2024, *SAMPE Europe Conference & Exhibition 2024: Advanced and Sustainable Composites*. SAMPE Europe (ed.). 12 p.

New hybrid design of carbon fibre composite rotor shafts with improved thermal conductivity in transverse direction for high-performance electric machines

Schiffner, M., Barth, J., Hoffeins, P., Spitzer, S., Taesch, J., Wafzig, J., Petrich, F., & 2 othersGaber, M. & Gude, M., Sept 2024, *SAMPE Europe Conference & Exhibition 2024: Advanced and Sustainable Composites*. SAMPE Europe (ed.). 12 p.

New concept for cryogenic gaseous hydrogen-cooled lightweight electric engine

Pohl, M., Grothe, R., Spitzer, S., Gude, M. & Modler, N., 5 Jul 2024, In: *IOP Conference Series: Materials Science and Engineering*. 1302, 1, 8 p., 012023.

Advancing sustainable marine propulsion: composite fuel storage tanks for next-generation NH₃-powered ships

Abhyankar, K. G., Tzortzinis, G., Antonowitz, H., Giannakis, A., Sykaras, K., Leschik, T., Filippatos, A., & 2 othersSpitzer, S. & Gude, M., 2 Jul 2024, *ECCM21 - Proceedings of the 21st European Conference on Composite Materials: Volume 1 - Industrial applications*. European Society for Composite Materials (ESCM), Vol. 1. p. 129-136 8 p.

Efficient approach to the dimensioning of hybrid metal-FRP interference-fitted connections with high circumferential speed

Schröder, L., Spitzer, S., Schiffner, M. & Gude, M., 2 Jul 2024, *ECCM21 - Proceedings of the 21st European Conference on Composite Materials: Volume 3 - Material and Structural Behavior – Simulation & Testing*. European Society for Composite Materials (ESCM), Vol. 3. p. 912-920 9 p.

Physical-virtual testing methodology for efficient property determination of tailored fiber-reinforced composite structural vanes for future jet engines

Töpfer, F., Hanisch, N., Spitzer, S., Schröder, L., Bittrich, L., Spickenheuer, A. & Gude, M., 2 Jul 2024, *ECCM21 - Proceedings of the 21st European Conference on Composite Materials: Volume 3 - Material and Structural Behavior – Simulation & Testing*. European Society for Composite Materials (ESCM), Vol. 3. p. 55-60 6 p.

Recyclinggerechte Struktur- und Fertigungsprozess-Gestaltung am Beispiel einer Triebwerkswelle aus Faser-Kunststoff-Verund für ein Strahltriebwerk der nächsten Generation

Violet, J., Spitzer, S., Schiffner, M., Dargel, A., Kupfer, R. & Gude, M., 1 Dec 2023.

Die virtuelle Spritzgießmaschine: Digitale Lernwerkzeuge für die Kunststofftechnik

Kupfer, R., Liebsch, A., Spitzer, S., Seifert, I., Klose, A. & Rickel, F., 7 Nov 2023, In: *Kunststoffe*. 113, 11, p. 48-51 4 p.

Recycling strategies for CFRP aerospace components using the example of a drive shaft for a next generation geared jet engine

Spitzer, S., Schiffner, M., Dargel, A., Günther, J., Kupfer, R., Violet, J. & Gude, M., 4 Oct 2023. 11 p.

Lightweight design of hybrid, circumferential reinforced high-pressure hydraulic cylinders

Birke, M., Gottwald, R., Meyer, J., Grüber, B., Spitzer, S. & Gude, M., 4 Aug 2023, *Proceedings of the 2023 International Conference on Composite Materials (ICCM23)*. 11 p. 70

Aerodynamic high-pressure hydrogen CFRP vessels with increased storage energy density: method for the optimization of a manufacturable laminate

Schlegel, D., Schmidt, F., Birke, M., Spitzer, S. & Gude, M., 3 Aug 2023, *Proceedings of the 2023 International Conference on Composite Materials (ICCM23)*. 12 p. 68

Interactive and model based development at the example of a structural and aerodynamic composite vane for a jet engine

Spitzer, S., Töpfer, F., Folprecht, F., Dargel, A., Langkamp, A. & Gude, M., 2 Aug 2023, *Proceedings of the 2023 International Conference on Composite Materials (ICCM23)*. 9 p. 305

Integration and interaction of variable-axial fibre reinforced composite components in the whole engine model for future jet engines

Töpfer, F., Dargel, A., Spitzer, S. & Gude, M., 30 Jun 2023. 7 p.

Bauteil eines Gasturbinenriebwerks und Verfahren zur Herstellung des Bauteils

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Part of a gas turbine engine and method for the manufacturing the part

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Contribution to the optimization of metal-composite lightweight structures in context of digital linked development processes

Folprecht, F., Bonn, F., Haider, D. R., Spitzer, S. & Gude, M., 19 Mar 2023, *Future Automotive Production Conference 2022*. Dröder, K. & Vietor, T. (eds.). Wiesbaden: Springer Nature , p. 228-236 9 p. (Zukunftstechnologien für den multifunktionalen Leichtbau).

Design and dimensioning of aerodynamic and structural vanes for jet engines made of multi-axial and variable-axial CFRP and comparison of these approaches with titanium vanes

Kluger, J., Spitzer, S., Spickenheuer, A., Bittrich, L., Klaus, C. & Gude, M., 12 Dec 2022, *Proceedings of the 20th European Conference on Composite Materials: Composites Meet Sustainability*. Vassilopoulos, A. P. & Michaud, V. (eds.). Ecole Polytechnique Fédérale de Lausanne (EPFL), Vol. 4. p. 565-572 8 p.

Fluorescent marking of fibre reinforced plastic for component and material identification in the context of material flow canalization

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Improvement potential for CFRP pressure vessels to reach future required gravimetric storage densities

Spitzer, S., Schlegel, D., Tönnishoff, L., Lee, S., Lee, S-E. & Gude, M., 12 Dec 2022, *Proceedings of the 20th European Conference on Composite Materials: Composites Meet Sustainability*. Vassilopoulos, A. P. & Michaud, V. (eds.). Vol. 5. p. 232-239 8 p.

Tailoring the structural behaviour of a composite gas-filled spring device for a switch in power grids

Folprecht, F., Bätzel, T., Kuhtz, M., Hoffeins, P., Gerlich, M., Spitzer, S. & Gude, M., 12 Dec 2022, *Proceedings of the 20th European Conference on Composite Materials: Composites Meet Sustainability*. Vassilopoulos, A. P. & Michaud, V. (eds.). Ecole Polytechnique Fédérale de Lausanne (EPFL), Vol. 5. p. 274-281 8 p.

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Neutral lightweight engineering: a holistic approach towards sustainability driven engineering

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Integration of high performance hybrid metal-composite-structures into the mechanical simulation model of a jet engine using the superelement method

Töpfer, F., Dargel, A., Spitzer, S. & Gude, M., 20 Oct 2022.

Leichtbaulösungen für die Wasserstoffspeicherung in der Luftfahrt

Bonn, F., Schlegel, D., Spitzer, S., Wollmann, T. & Gude, M., 27 Sept 2022.

Sicherheitsaspekte in der Wasserstoffnutzung und -speicherung für die Luftfahrt

Vater, M., Schlegel, D., Spitzer, S., Haberstroh, C., Hurtado, A. & Gude, M., 27 Sept 2022.

Sicherheitskritische Faser-Kunststoff-Verbund-Strukturen für zukünftige getriebeübersetzte Strahltriebwerke

Violet, J., Spitzer, S., Dargel, A. & Gude, M., 27 Sept 2022.

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Stress-dependent and spatially-resolved potential assessment of hybrid designs for a structural guide vane

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Intrinsic interfaces between additively manufactured metal and composite structures for use in electric propulsion engines

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A digital process-data-assessment method for tailored fiber placement preforms in the manufacturing process of the structural composite guide vanes of a jet engine

Kluger, J., Spitzer, S., Frase, G., Finger, L., Klaus, C., Friebe, S. & Gude, M., 2022, *SAMPE EUROPE Conference and Exhibition 2022: Composites – the gateway to green mobility?*. 8 p.

Aerodynamic high-pressure hydrogen CFRP vessels with increased storage energy density for green aviation: Novel design and dimensioning method

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Welle-Nabe-Verbindung zwischen additiv gefertigter metallischer Welle und Faser- Kunststoff-Verbund Rotor eines Hochleistungs-Elektromotors für Luftfahrtantriebe

Pohl, M., Grothe, R., Spitzer, S., Troschitz, J. & Gude, M., 2022, *Welle-Nabe-Verbindungen 2022: Dimensionierung – Fertigung – Anwendungen und Trends*. VDI Verlag, Düsseldorf, Vol. 2022. p. 223 - 230 8 p. (VDI Berichte, Vol. 2408).

Effiziente und robuste Entwicklung komplexer Faserverbund-Triebwerkstrukturen

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Wasserstoffspeicherung und -versorgung für Flugzeuge der Zukunft

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Contribution to digital linked development, manufacturing and quality assurance processes for metal-composite lightweight structures

Haider, D. R., Folprecht, F., Gerritzen, J., Krahl, M., Spitzer, S., Hornig, A., Langkamp, A., & 1 othersGude, M., 11 Mar 2021, *Technologies for economic and functional lightweight design*. p. 45-58 14 p. (Zukunftstechnologien für den multifunktionalen Leichtbau).

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Dargel, A., Kluger, J., Klaus, C., Spickenheuer, A., Bittrich, L., Spitzer, S., Schubert, K., & 2 othersFeltin, D. & Gude, M., 2021, *Tagungsband SAMPE Europe Conference 2021*. 9 p.

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Zur werkstoffgerechten Gestaltung und Auslegung hybrider Antriebswellen in Metall/Faser-Kunststoff-Verbund-Bauweise

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Sun, X., Kawashita, L. F., Wollmann, T., Spitzer, S., Langkamp, A. & Gude, M., 26 Apr 2018, In: *Production Engineering*. 12, 2, p. 215-228 14 p.

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Efficient, robust development processes for additive manufactured hybrid lightweight structures

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Efficient, robust development processes for additive manufactured hybrid lightweight structures

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Failure mode based design and dimensioning method for metal-composite-structures

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Ultraleichte Antriebswellen - Hochleistungsantriebswellen in ultraleichter Mischbauweise: Neue praxisgerechte Gestaltungsrichtlinien für hochbeanspruchte Welle-Nabe-Verbindungen

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Activities

Lightweight design of hybrid, circumferential reinforced high-pressure hydraulic cylinders

Birke, M. (Involved person), Gottwald, R. (Involved person), Schlegel, D. (Speaker), Meyer, J. (Involved person), Grüber, B. (Involved person), Spitzer, S. (Involved person), Gude, M. (Involved person)
Aug 2023

tryING.Korean - Sommerschule 2023 für hochbegabte koreanische Schüler:innen

Modler, N. (Organiser), Spitzer, S. (Member of programme committee)
24 Jul 2023 → 28 Jul 2023

Hydrogen storage in a commuter aircraft: combining classical engineering design process with model based systems engineering for CFRP pressure vessel integration

Spitzer, S. (Involved person), Peciak, M. (Speaker), Dexl, F. (Involved person), Schmidt, F. (Involved person), Antonowitz, H. (Involved person), Langkamp, A. (Lecturer), Skarka, W. (Involved person), Markmiller, J. F. C. (Involved person), Gude, M. (Involved person)
5 Jul 2023

Sicherheitsaspekte in der H₂-Nutzung und –speicherung für die Luftfahrt

Vater, M. (Speaker), Schlegel, D. (Involved person), Spitzer, S. (Involved person), Haberstroh, C. (Speaker), Hurtado Gutierrez, A. (Involved person), Gude, M. (Involved person)
27 Sept 2022

Combined virtual-physical design process of a graded CFRP-titanium structure at the example of a lightweight strut for aircraft applications

Birke, M. (Speaker), Gottwald, R. (Involved person), Spitzer, S. (Involved person), Luft, J. (Involved person), Meyer, J. (Involved person), Gude, M. (Involved person)
22 Jul 2022

Konstruktive Entwicklung von Leichtbaustrukturen im Kontext der Digitalisierung

Spitzer, S. (Speaker)
18 Jun 2021

Tohoku University

Spitzer, S. (Visitor)
May 2009 → Aug 2009

Prizes

ACL Young Talent Award 2010

Spitzer, S. (Recipient), 17 Jun 2010

AVK-Preis in der Kategorie „Forschung/ Wissenschaft“

Hufenbach, W. (Applicant/PI), Kupfer, R. (Recipient) & Spitzer, S. (Recipient), 2015

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Manfred-Hirschvogel-Preis

Spitzer, S. (Recipient), 19 Jan 2021

Rolls-Royce Deutschland Innovation Award

Klaus, C. (Recipient), Rao, R. N. (Recipient), Spitzer, S. (Recipient) & Gude, M. (Recipient), 11 Sept 2023

Rolls-Royce Deutschland Innovationspreis 2024

Rao, R. N. (Recipient), Röth, M. (Recipient), Klaus, C. (Recipient), Salcedo, P. M. (Recipient), Spitzer, S. (Recipient), Töpfer, F. (Recipient) & Gude, M. (Recipient), 16 Sept 2024