

Language: English

Date : Apr.20 (Thu), 2017, 14:00–15:00

Location : W524, 5F, Cooperation Center, Wako Campus, RIKEN

Title : Innovation of Digital Photonic Production
along the lines of Industrie 4.0

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The context of future Laser Applications in modern manufacturing can be summarized by “Digital Photonic Production”. The vision of designing a structure or product in the computer and creating it additively or by ablation with high power ultrafast lasers drives many research topics in this area. But also the integration into production chains with the challenge of meeting the demands of production along the lines of Industry 4.0 is starting to be addressed seriously. From the point of Laser technology, main fields of activity are measurement processes of quality relevant data on-line, process control mechanisms and the combination with automation as a whole. A huge challenge is the data handling and control system technology, which up to now is fragmented and component specific. The need of more integrated data control systems becomes obvious.

Of course, the processes themselves are under intense investigation, such as Selective Laser Melting, Laser Metal Deposition, Laser Ultrafast Ablation and Laser Polishing. Build up and removal rates are the prime goal under economical aspects. New concept and performance results under this aspect will be presented. But also correspondingly increased quality of the resulting products in terms of surface roughness and distortion is a key issue of consideration.

To address these challenges effectively, new ways of collaboration of Public Private Partnerships PPP are believed to be successful. Examples of strategic PPP collaboration will be given, the BMBF-Research-Campus-project DPP will be displayed in its present status. Especially the research strategy in form of road mapping and collaboration in sub clusters develops to an essential factor in this innovation concept. Ultimately the development resulted in the “Innovation Center for Digital Photonic Production”, a conglomerate of app. 20 companies locating their research activities in the corresponding new building in close cooperation and vicinity with ILT and the RWTH Laser University Chairs.

On the very fundamental side, research topics and roadmaps identified by 15 interdisciplinary collaborating RWTH-chairs in the frame of the “Research Center for Digital Photonic Production” will be demonstrated and discussed. Its home will be a corresponding building, which is under construction and will come to operation in the very near future.