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NEWS
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Nature as an example: the water-repellent surface of the floating fern is imitated in the laboratory

The AIRCOAT project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 764553.

REVOLUTION IN HULL COATING?
AIRCOAT AIMS AT FRICTION REDUCTION

Reducing the friction of a ship's hull in the water decreases energy consumption and costs. Therefore, a number of solutions for improved hull surfaces have already been developed: from fouling-release coatings via the so-called active air lubrication by means of air bubbles to biomimetic surfaces, which mimick shark or dolphin skin. It is estimated that such technologies have a potential to save 6 to 10% of energy use and emissions.

A new innovative solution is now being developed at the CML: the project AIRCOAT („Air Induced friction Reducing ship COATing") aimes at developing a biomimetic self-adhesive foil technology by technologically implementing the Salvinia effect. This natural phenonema allows the salvinia plant, a floating water fern, to breathe under water by forming and maintaining a permanent layer of air.

The conversion of this attribute to a foil enables a so called passive air lubrication. Preliminary research in this field showed the possibility to mimick the Salvinia effect, and initial estimations suggest a significantly higher savings potential than the technologies mentioned above. Until summer 2021, CML and six European partners from research and industry, strive not only at developing the foil, but at transferring the AIRCOAT to a larger scale and application to real ships.

CML coordinates the project and will use its expertise in applied maritime science to bridge the gap between research and industry to ensure the holistic AIRCOAT approach. CML will contribute to optimizing the AIRCOAT surface structure via experimental and numerical methods and analyze the results. Besides developing a method to quantify and monitor the air layer, CML will further be part of assessing the economic and environmental impact of AIRCOAT.

OPPORTUNITIES FOR SHIPBUILDING SUPPLIERS
NEW BUSINESS MODELS IN AFTER SALES SERVICES

The business environment in the maritime supply industry has changed noticeably. Studies by industry associations show that companies are already generating large shares of revenues with the sale of spare parts or the offer of maintenance and repair orders.

A new study conducted by the VDMA (AG Marine Equipment and Systems) in cooperation with the Fraunhofer CML focuses on the digitization of service in the maritime supply industry. The results of interviews and a survey of industry representatives have shown that the scope of the changes in service by the maritime industry 4.0 has now been largely recognised. The implementation of digitization projects in service is also increasing in scope and number.

The previous study „Erfolgsfaktor (=Success Factor) After Sales Service" by CML and VDMA from 2016 already emphasized the decisive importance of product-accompanying services in the maritime supply industry. Due to the high earnings potential, especially for industrial goods, and as a differentiator against competing manufacturers, service has an influence on long-term business success that should not be underestimated.

Undoubtedly, the biggest changes in the maritime industry at present are the comprehensive availability of the latest data from ship operation, the increasingly powerful communication solutions in the maritime surrounding and the transfer of innovative methods for the analysis of large amounts of data in fields of applications related to shipping.

Selected survey results show: Two thirds of those surveyed see digitization as an important factor and a great opportunity for their competitiveness. Value creation through data-based services will also increase, with additional competition from new market participants. And more than half of the companies realize that data security and a lack of specialists and missing competencies will pose the greatest challenges during implementation.

FOREWORD

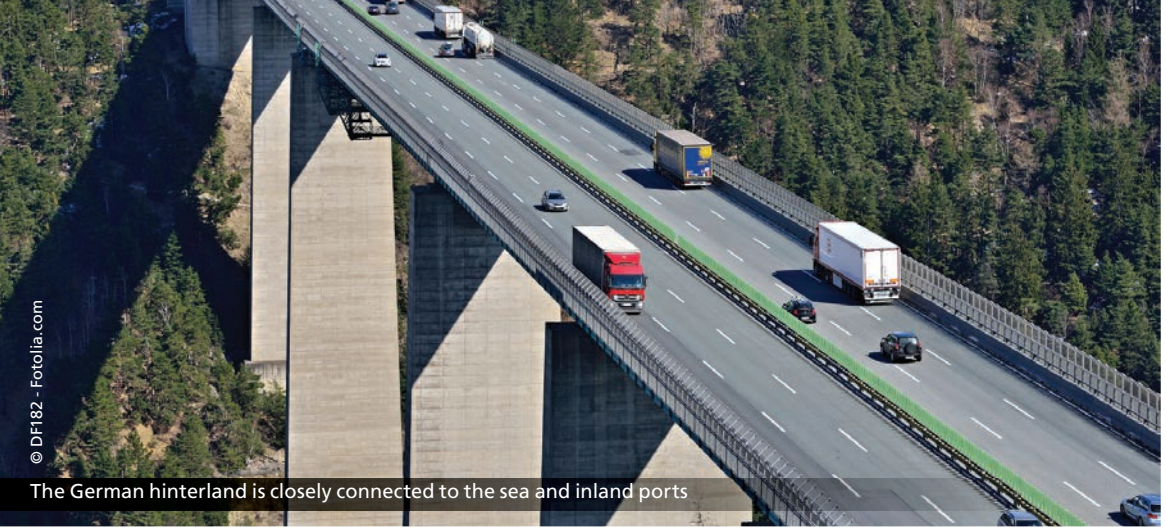
Dear Readers,

Efficiency and environmental impacts of maritime shipping are topics that have been with us at the CML from day one. We conducted several studies on the energy efficiency of port terminals, analyzed sites for their suitability as LNG terminals and developed a weather routing solution for (fuel-efficient) ship voyages. What is new for us is the use of bionics in this context. Read in this newsletter about AIRCOAT what this is all about.

Another highlight is our assignment to identify the employment impact of German sea and inland ports. Together with other partners, we are developing a uniform methodology for determining economic effects.

We hope you enjoy reading!

Your Prof. Carlos Jahn
Head of Fraunhofer CML



The German hinterland is closely connected to the sea and inland ports

GERMAN SEA AND INLAND PORTS
DETERMINATION OF EMPLOYMENT EFFECTS

The creation and preservation of jobs in Germany is often an important criterion for political decision-makers when determining political priorities. Studies exist for many port locations that determine their economic importance for the location, the region or beyond. However, since there are no binding methods for determining direct, indirect and induced employment, existing studies are difficult to compare. Moreover, due to overlapping reference areas and system-related statistical inaccuracies, no conclusions can be drawn from the existing studies on the overall employment effects of German sea and inland ports for Germany.
That's about to change: On behalf of the Federal Ministry of Transport and Digital Infrastructure (BMVI), the CML is working with the Institute of Shipping Economics and Logistics ISL, the Fraunhofer IML, Economic Trends Research and Prof. Holocher und Partner to develop a uniform methodology for this task. This includes the survey of the economic importance of all German sea and inland ports on the basis of their employment effect for the whole of Germany.
The CML carries out a nationwide survey of the port-related economy to collect original data. The survey is an important basis for the first-time determination of the economic importance of the German sea and inland ports as a whole. Companies and organisations from the port industry, the port dependent transport chain and the port dependent industry are expressly requested to participate in the online survey. You can find the link to the questionnaire (only in German) on our homepage www.cml.fraunhofer.de.
In addition, the consortium will formulate port policy recommendations based on the study results. The BMVI expects the results to provide a reliable planning basis for port development and infrastructure planning measures.

FRAUNHOFER AT THE SMM 2018
HIGHLIGHTS OF MARITIME RESEARCH

The SMM Shipbuilding, Machinery & Marine Technology is the largest maritime trade fair in Europe. Here innovations are presented, contacts maintained and networks expanded. 50,000 visitors from all over the world are expected at the Hamburg Exhibition Centre in September.
The **CML** will once again be present on a joint stand with six other Fraunhofer institutes. The spectrum of exhibits is wide: CML will present its solution for optimized crew planning for ship fleets SCEDAS and the AIRCOAT project, which involves the development of an innovative hull coating (see article on page 1).
The **Fraunhofer IFAM** from Bremen shows test environments on Helgoland and Sylt, which are used for scientific research, e.g. for corrosion and fouling protection under real environmental conditions of the North Sea and the Baltic Sea.
A novel solution for the detection of shipwrecked persons by a special radar is currently being developed in cooperation with the **Fraunhofer FHR** from Wachtberg and will demonstrate during the fair, how a suitably equipped person can also be found in crowds.
The **Fraunhofer IGP** from Rostock presents the latest developments for maritime production and brings along two robots that demonstrate their special capabilities. And the **Fraunhofer LBF** from Darmstadt shows innovative elements for vibration reduction in the maritime environment.
The **Fraunhofer IGD** from Rostock and the **Fraunhofer IDMT** from Oldenburg present themselves digitally with the use of visual computing and a training platform for maritime communication. Both exhibits invite to try them out.

New this year is our offer of lectures at the booth: Every day at 11 a.m. and 3 p.m. the Fraunhofer researchers will present selected solutions in short lectures and demonstrations.
Furthermore, the **Fraunhofer Forum Waterborne** with the title „Shipping Under Extreme Conditions" will take place at this year's SMM. All current information can be found on our website.

Visit us at booth 319 in hall 4!

IN BRIEF

*The **Hamburg Innovation Summit** on May 7 was held for the third time and brought together „visionaries, founders and creators of the future" in Harburg's inland port. Within sight of the building site for the future building of the Fraunhofer CML, lectures and exhibitions focused on trends, innovations and the future of technology. The Fraunhofer stand, which united the Hamburg Fraunhofer institutions for the first time, and the successful Fraunhofer Science Slam had their premiere at the summit.*

***Maritime Innovation Insights MII** - the new lecture event of the CML was a great success. More than 70 participants had registered for the event on May 3, 2018. The focus of the new annual event is the presentation of innovative projects and developments by CML researchers and selected project partners. This year, the focus was on the advantages and potential of digitization. The next MII will take place on May 9, 2019.*

+++DATES+++

- ***SMM 2018**, September 4-7, 2018, Hamburg*
- ***Hamburg International Conference of Logistics,** September 12-14, 2018, Hamburg*
- ***35. International Supply Chain Conference,** October 17-19, Berlin*

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