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## Experimental investigation of blade and propeller loads during straight ahead sailing

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During operative scenarios, the propeller can experience an inflow substantially different from the one considered in the design phases and the 3D character of the flow gives onset to a complete system of loads. The quantification of these loads is of paramount importance to assess the reliability of mechanical structures, the comfort on-board due to vibrations and the effects on the dynamic response of the vessel.

CNR-INSEAN Manoeuvring basin allows testing large free-running models, simulating a wide set of operative situations: the authors focused their attention on the forces generated on the propeller and the shaft-line during off-design conditions. Recently, an experimental setup for the evaluation of propeller in-plane and bearing loads in operative, behind hull, conditions has been developed by using a novel patented transducer. This activity evidenced interesting hydrodynamic phenomena occurring during transient phases of manoeuvres. These results fostered a new research activity, for the first time carried out by free running, self-propelled model test, aimed to a more detailed investigation by means of measuring single blade loads. In this paper, the setup and the analysis of the straight ahead motion, as part of an extensive experimental campaign, are presented.

**Primary author:** Dr ORTOLANI, Fabrizio (CNR-INSEAN)

**Co-authors:** Dr DUBBIOSO, Giulio (CNR-INSEAN); Dr SANTIC, Ivan (CNR-INSEAN); Dr MAURO, Salvatore (CNR-INSEAN)

**Presenter:** Dr ORTOLANI, Fabrizio (CNR-INSEAN)

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