

## SHIP DRAG REDUCTION BY AIR LUBRICATION

### PROJECT AIM

The aim of this project is to enhance the effects of air lubrication on frictional drag significantly, by improving our knowledge on the detailed mechanisms and its scale effects. With this knowledge the effectiveness of air lubrication should be increased in order to make application on ships feasible.

### PROGRESS

A zero pressure gradient developing boundary layer is created under a flat surface in a water channel. This boundary layer is fully characterised by LDA. A direct shear sensor is designed and build in order to measure wall shear stresses at low velocity, two-phase flow. At this moment a stereo PIV system is set up to measure velocity statistics, wall shear stress and bubble concentration simultaneously. A numerical Eulerian-Lagrangian code is developed to study the statistical behaviour of bubbles in a turbulent channel.

### DISSERTATIONS

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### SCIENTIFIC PUBLICATIONS

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### PROJECT LEADERS

T van Terwisga

### RESEARCH THEME

Complex dynamics of fluids

### PARTICIPANTS

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### COOPERATIONS

Delft University of Technology  
Twente University  
PPG Industries  
MARIN

### FUNDED

STW, PPG, MARIN  
1<sup>st</sup> - 2<sup>nd</sup> 87% 3<sup>rd</sup> 13%

### START OF THE PROJECT

2007

### INFORMATION

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