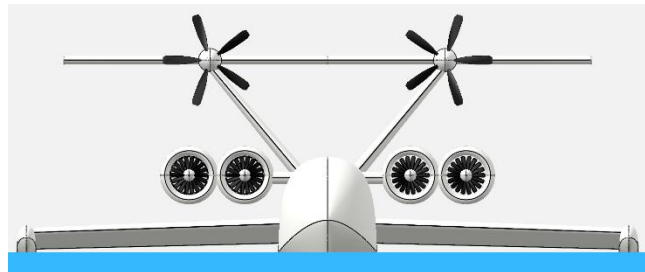


## Student Project

<b>Topic</b>	<b>Modelling of Wing-in-ground-effect vehicle performance and aerodynamics for conceptual design</b>
<b>Subject focus</b>	Conceptual Aircraft Design, Methodology Development
<b>Contact</b>	Dr.-Ing. Stanislav Karpuk, IFL Raum 033 s.karpuk@tu-braunschweig.de, Tel. 0531 / 391 9929
<b>Requirements</b>	<ul style="list-style-type: none"><li>• Solid programming skills in one of languages: Python, MATLAB</li><li>• Fundamentals of conceptual aircraft design (EVV 1-2 courses required)</li><li>• Experience with aircraft design software (SUAVE, CEASIOM, or other) is a plus</li><li>• Fluency in written and speaking English</li></ul>

### Introduction

Wing-in-ground-effect (WIG) vehicle represent a unique man of naval transportation. Its unique features of utilizing the ground effect phenomenon have proven its potential to be an efficient vehicle. However, limitations of operations, design, and applications prevented WIG craft from becoming a widespread transportation type. However, advances in materials, control systems, and design methods may reopen possibilities for new concepts of WIG craft. Given the complexities of the ground effect phenomenon, a comprehensive methodology for WIG sizing, analysis, optimization, and testing is required to reassess the potential of WIG craft.



The present project focuses on enhancements of modelling capabilities of SUAVE aircraft design environment for more aerodynamic and performance analysis of WIG craft of different kinds. The project consists of the development and testing phases.

### Task Description

- Development essential capabilities of SUAVE to model WIG aerodynamics and simulate the flight mission in the context of WIG sizing.
- Test the capabilities based on several existing WIG craft and propose a potential WIG craft concept for regional transportations
- Report obtained results and provide recommendations for future research initiatives.

**Start date: Immediate**