2nd Blog POST – UNIVERSITY OF SOUTHAMPTON SUMOTH TEAM

May 1st, 2022

First of all, a big shout out to our newest sponsor:

A huge welcome to a Southampton based company *Generation Graphics.* They are an expert in marine wrapping, graphics & branding, and kindly sponsored the wrapping services of our SuMoth.

The team also welcomed the exciting news from our existing sponsor:

Maguire Boats, the local shipyard based in Hampshire and the creator of the race-winning Exocet, again generously sponsored us with boom, gantry, wand system, sail, and main foil.

The Grand Reveal of SuMoth:

We had shown you the 3D model of our SuMoth in the previous blog, and this month we proudly present you the actual moth itself, with the wooden wing bars.

Figure 1: Our SuMoth fitted with the wooden wing bars.

Testing:

We are always interested in the structural performance of our SuMoth. This is why we had brought our SuMoth to our university's Structure Testing Lab to conduct hull and wing bar testing. The FEA studies can also be validated and compared to the results.

For hull testing, we applied weights on the hull and measured the deflection of 8 different locations using strain gauges.

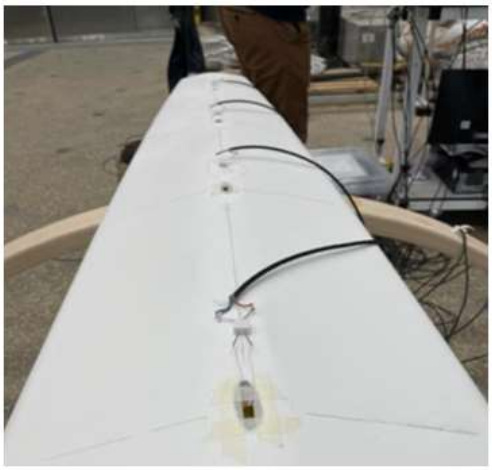

Figure 2: Hull testing in the University of Southampton Structure Testing Lab.

For wing bar testing, we hung weights on 3 different locations of the wing bar and measured its deflection using Linear Vertical Displacement Transducer (LVDT) available in the lab.

Figure 3: LDTV testing on the deflection of wing bars.

The team will be working on the analysis of the result from the testing during the Easter break. In the meantime, you can watch the video clip on our Facebook page of the testing done on our new moth.

Wood testing:

We have been back in the Testing and Structures Research Laboratory (TSRL) at Bolderwood campus to test the wood that the wing bars are built from. As wood is a natural material, each bit of wood from a different tree doesn't necessarily have the exact same structural properties. We have used the given value for the Young's Modulus from online data sheets, but we wanted to test what the Young's Modulus of the wood we used is. We had leftover pieces of wood from the manufacturing of the wing bar, and we cut these into the correct sizes for the testing machine and then ran tensile testing on three specimens as shown in figure 4.

Figure 4: Tensile testing of wood specimen.

Flight control system testing:

We have been in the Bolderwood Towing Tank, running some tests on both a traditional wand system as well as a sensor driven system that we are designing. Using the wavemaker we were able to produce waves (figure 5) so that the sensor could measure the different wave heights.

Figure 5: Picture looking down the towing tank from the carriage showing the waves.

Figure 6: Experimental setup on the carriage showing wand system, sensor, and weights.

Figure 6 shows the traditional wand and the sensor ready for testing. The experiments went well, and we are now analysing all the data we collected to understand how well the sensor driven system works.

Update on the Boat:

We have fixed the gantry onto the stern of the boat as seen in figure 7. Next week we will move onto painting the boat and continuing to fit it out so that we are ready to sail her in June!

Figure 7: Picture showing the gantry fixed onto the stern of the boat.

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