Exercise 4: Experimental determination of lift and drag coefficients of a T-foil

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| Name | Unit | -2.9 deg | -2.9 deg | -2.9 deg | -2.9 deg | -2.9 deg |
| Date | m-d-y | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 |
| Time | h:m:s | 13:20:15 | 13:19:55 | 13:19:31 | 13:19:04 | 13:18:40 |
| Water\_Speed\_voltage | V-in | 9.0727 | 5.7421 | 3.3271 | 1.5345 | 0.3692 |
| Tunnel\_Pressure | KPa | 82.2623 | 92.2390 | 99.9617 | 106.5278 | 110.4108 |
| Drag | N | 227.4926 | 144.1733 | 83.9873 | 38.3101 | 10.0958 |
| Lift | N | -57.4404 | -12.1077 | 1.8019 | 2.9116 | -6.8382 |
| Water\_velocity | m/s | 7.2349 | 5.7557 | 4.3812 | 2.9750 | 1.4534 |
| Sigma\_V |  | 3.0416 | 5.4080 | 10.1389 | 23.4896 | 104.8121 |
| sigma |  | 3.0476 | 5.4176 | 10.1550 | 23.5069 | 102.1689 |
| CD |  | 0.0718 | 0.0719 | 0.0723 | 0.0715 | 0.0789 |
| CL |  | -0.0181 | -0.0060 | 0.0015 | 0.0054 | -0.0535 |

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| Name | Unit | 6 deg | 6 deg | 6 deg | 6 deg |
| Date | m-d-y | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 |
| Time | h:m:s | 13:06:15 | 13:05:58 | 13:05:40 | 13:05:08 |
| Water\_Speed\_voltage | V-in | 5.5079 | 3.1571 | 1.4731 | 0.3658 |
| Tunnel\_Pressure | KPa | 93.4454 | 101.4159 | 107.7960 | 111.7097 |
| Drag | N | 89.6349 | 51.7830 | 24.6871 | 6.8843 |
| Lift | N | 1345.6985 | 765.0584 | 336.7003 | 84.8946 |
| Water\_velocity | m/s | 5.6371 | 4.2678 | 2.9148 | 1.4460 |
| Sigma\_V |  | 5.7142 | 10.8451 | 24.7729 | 107.4974 |
| sigma |  | 5.7240 | 10.8615 | 24.7865 | 104.4541 |
| CD |  | 0.0466 | 0.0470 | 0.0480 | 0.0544 |
| CL |  | 0.7000 | 0.6943 | 0.6550 | 0.6711 |

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| Name | Unit | 4 deg | 4 deg | 4 deg | 4 deg | 4 deg |
| Date | m-d-y | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 |
| Time | h:m:s | 12:51:46 | 12:51:30 | 12:51:11 | 12:50:47 | 12:50:29 |
| Water\_Speed\_voltage | V-in | 8.7123 | 5.5724 | 3.1678 | 1.4610 | 0.3858 |
| Tunnel\_Pressure | KPa | 83.8552 | 93.4518 | 101.4910 | 107.9586 | 111.8562 |
| Drag | N | 197.8988 | 123.8948 | 69.4328 | 30.7754 | 8.5019 |
| Lift | N | 1649.0584 | 1061.7920 | 611.1911 | 277.3741 | 64.4877 |
| Water\_velocity | m/s | 7.0897 | 5.6700 | 4.2750 | 2.9029 | 1.4904 |
| Sigma\_V |  | 3.2309 | 5.6481 | 10.8165 | 25.0133 | 98.9402 |
| sigma |  | 3.2371 | 5.6581 | 10.8330 | 25.0293 | 98.4604 |
| CD |  | 0.0651 | 0.0637 | 0.0628 | 0.0604 | 0.0633 |
| CL |  | 0.5423 | 0.5459 | 0.5528 | 0.5441 | 0.4799 |

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| Name | Unit | 2 deg | 2 deg | 2 deg | 2 deg | 2 deg |
| Date | m-d-y | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 |
| Time | h:m:s | 12:39:22 | 12:39:05 | 12:38:47 | 12:38:30 | 12:38:13 |
| Water\_Speed\_voltage | V-in | 8.8072 | 5.6407 | 3.1876 | 1.4693 | 0.3533 |
| Tunnel\_Pressure | KPa | 83.8580 | 93.3818 | 101.6304 | 108.0674 | 111.9925 |
| Drag | N | 231.0384 | 144.4597 | 80.9978 | 36.2169 | 9.1025 |
| Lift | N | 1185.0719 | 773.4508 | 443.0226 | 201.5673 | 43.5994 |
| Water\_velocity | m/s | 7.1283 | 5.7046 | 4.2883 | 2.9111 | 1.4204 |
| Sigma\_V |  | 3.1959 | 5.5755 | 10.7646 | 24.8993 | 112.0939 |
| sigma |  | 3.2023 | 5.5853 | 10.7810 | 24.9138 | 108.5455 |
| CD |  | 0.0752 | 0.0734 | 0.0728 | 0.0706 | 0.0746 |
| CL |  | 0.3855 | 0.3928 | 0.3982 | 0.3931 | 0.3572 |

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| Name | Unit | 0 deg | 0 deg | 0 deg | 0 deg | 0 deg |
| Date | m-d-y | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 | 02-16-11 |
| Time | h:m:s | 12:27:54 | 12:27:24 | 12:27:05 | 12:26:30 | 12:26:03 |
| Water\_Speed\_voltage | V-in | 8.8325 | 5.6485 | 3.2184 | 1.4926 | 0.3662 |
| Tunnel\_Pressure | KPa | 83.8868 | 93.4308 | 101.6852 | 108.1706 | 112.1566 |
| Drag | N | 243.2164 | 152.8222 | 87.2536 | 40.0430 | 10.3704 |
| Lift | N | 665.1731 | 449.4884 | 268.4671 | 119.9384 | 21.0448 |
| Water\_velocity | m/s | 7.1385 | 5.7086 | 4.3090 | 2.9341 | 1.4469 |
| Sigma\_V |  | 3.1879 | 5.5708 | 10.6683 | 24.5351 | 107.7783 |
| sigma |  | 3.1943 | 5.5806 | 10.6839 | 24.5498 | 104.7629 |
| CD |  | 0.0789 | 0.0775 | 0.0777 | 0.0769 | 0.0819 |
| CL |  | 0.2158 | 0.2280 | 0.2390 | 0.2303 | 0.1662 |

