

Predictions of the Resistance and Squat of Series 64 Hulls

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Summary

Predictions of resistance and squat of Series 64 hulls are compared to measured values.

Notes

The performance of Series 64 was first reported by Yeh [2]. Robards [1] also used the series in his thesis.

Predictions are, in general, very good for Froude numbers below about 1.0. At higher Froude numbers it is likely that splash and spray become important and that some additional form drag would be justified in these cases.

TODO: Include squat experiments for comparison.

References

- [1] Robards, Simon William, “The hydrodynamics of high-speed transom-stern vessels”, *M. Engineering thesis*, The University of New South Wales, Nov. 2008.
- [2] Yeh, H.J.H., “Series 64 resistance experiments on high-speed displacement forms, Marine Technology, Society of Naval Architects and Marine Engineers, July 1965, pp. 248271.

Model	L (m)	L/B	B/T	C_{∇}	C_B	C_M	C_P	C_{VP}	C_{WP}	S/L^2	B_T/B	T_T/T	C_{AT}
4787	3.048	11.956	2.0	8.04	0.55	0.818	0.644	0.746	0.738	0.109	0.833	0.489	0.965
4788	3.048	14.020	2.0	8.94	0.55	0.818	0.644	0.746	0.738	0.093	0.833	0.489	0.965
4789	3.048	17.734	2.0	10.50	0.55	0.818	0.644	0.746	0.738	0.074	0.833	0.489	0.965
4790	3.048	9.762	3.0	8.04	0.55	0.818	0.644	0.746	0.738	0.111	0.833	0.489	0.965
4791	3.048	11.447	3.0	8.94	0.55	0.818	0.644	0.746	0.738	0.094	0.833	0.489	0.965
4792	3.048	14.479	3.0	10.50	0.55	0.818	0.644	0.746	0.738	0.074	0.833	0.489	0.965
4793	3.048	8.454	4.0	8.05	0.55	0.818	0.644	0.746	0.738	0.115	0.833	0.489	0.965
4794	3.048	9.914	4.0	8.94	0.55	0.818	0.644	0.746	0.738	0.098	0.833	0.489	0.965
4795	3.048	12.540	4.0	10.50	0.55	0.818	0.644	0.746	0.738	0.077	0.833	0.489	0.965
4796	3.048	11.956	2.0	8.60	0.45	0.677	0.637	0.605	0.743	0.102	0.830	0.392	0.920
4797	3.048	14.069	2.0	9.58	0.45	0.677	0.637	0.605	0.743	0.087	0.830	0.392	0.920
4798	3.048	17.934	2.0	11.30	0.45	0.677	0.638	0.606	0.743	0.068	0.830	0.392	0.620
4799	3.048	9.762	3.0	8.60	0.45	0.677	0.637	0.605	0.743	0.104	0.830	0.392	0.920
4800	3.048	11.487	3.0	9.58	0.45	0.677	0.637	0.605	0.743	0.088	0.830	0.392	0.920
4801	3.048	14.643	3.0	11.30	0.45	0.677	0.637	0.605	0.743	0.069	0.830	0.392	0.920
4802	3.048	8.454	4.0	8.60	0.45	0.677	0.637	0.605	0.743	0.109	0.830	0.392	0.920
4803	3.048	9.948	4.0	9.58	0.45	0.677	0.637	0.605	0.743	0.093	0.830	0.393	0.920
4804	3.048	12.682	4.0	11.30	0.45	0.677	0.637	0.605	0.743	0.073	0.830	0.392	0.920
4805	3.048	11.956	2.0	9.35	0.35	0.527	0.627	0.474	0.738	0.095	0.838	0.308	0.896
4806	3.048	14.146	2.0	10.50	0.35	0.527	0.627	0.474	0.738	0.081	0.838	0.308	0.896
4807	3.048	18.264	2.0	12.40	0.35	0.527	0.627	0.474	0.738	0.062	0.838	0.308	0.896
4808	3.048	9.762	3.0	9.35	0.35	0.527	0.627	0.474	0.738	0.097	0.838	0.308	0.896
4809	3.048	11.551	3.0	10.50	0.35	0.527	0.627	0.474	0.738	0.082	0.838	0.308	0.896
4810	3.048	14.913	3.0	10.50	0.35	0.527	0.627	0.474	0.738	0.064	0.838	0.308	0.896
4811	3.048	8.454	4.0	9.35	0.35	0.527	0.627	0.474	0.738	0.103	0.838	0.308	0.896
4812	3.048	10.004	4.0	10.50	0.35	0.527	0.626	0.474	0.738	0.087	0.838	0.308	0.896
4813	3.048	12.915	4.0	12.40	0.35	0.527	0.627	0.474	0.738	0.067	0.838	0.308	0.896

Table 1: Principal particulars of Series 64 model hulls.

	x_B/L	z_B/T	x_F/L	$1000I_L/L^4$	$1000I_T/L^4$	$\overline{\text{GM}}_{L0}/L$	$\overline{\text{GM}}_{T0}/B$
4787	0.0689	-0.397	0.094	4.18	0.027	2.15	-0.029
4788	0.0689	-0.397	0.094	3.56	0.017	2.53	-0.029
4789	0.0689	-0.397	0.094	2.82	0.008	3.21	-0.029
4790	0.0689	-0.397	0.094	5.12	0.050	2.64	0.121
4791	0.0689	-0.397	0.094	4.36	0.031	3.10	0.121
4792	0.0689	-0.397	0.094	3.45	0.015	3.93	0.121
4793	0.0689	-0.397	0.094	5.89	0.076	3.06	0.238
4794	0.0689	-0.397	0.094	5.04	0.048	3.59	0.239
4795	0.0689	-0.397	0.094	3.99	0.024	4.54	0.239
4796	0.0665	-0.348	0.094	4.22	0.028	2.67	0.036
4797	0.0665	-0.348	0.094	3.59	0.017	3.15	0.036
4798	0.0665	-0.348	0.094	2.82	0.008	4.01	0.036
4799	0.0665	-0.348	0.094	5.17	0.051	3.27	0.199
4800	0.0665	-0.348	0.094	4.40	0.031	3.85	0.199
4801	0.0665	-0.348	0.094	3.45	0.015	4.92	0.199
4802	0.0665	-0.348	0.094	5.97	0.078	3.79	0.333
4803	0.0665	-0.348	0.094	5.08	0.048	4.46	0.333
4804	0.0665	-0.348	0.094	3.98	0.023	5.68	0.333
4805	0.0705	-0.294	0.098	4.14	0.028	3.37	0.124
4806	0.0705	-0.294	0.098	3.50	0.017	4.00	0.124
4807	0.0705	-0.294	0.098	2.71	0.008	5.17	0.125
4808	0.0705	-0.294	0.098	5.07	0.051	4.14	0.309
4809	0.0705	-0.294	0.098	4.29	0.031	4.90	0.309
4810	0.0705	-0.294	0.098	3.32	0.014	6.33	0.309
4811	0.0705	-0.294	0.098	5.86	0.079	4.78	0.469
4812	0.0705	-0.294	0.098	4.95	0.047	5.66	0.469
4813	0.0705	-0.294	0.098	3.84	0.022	7.31	0.469

Table 2: Principal hydrostatic particulars of Series 64 hulls.

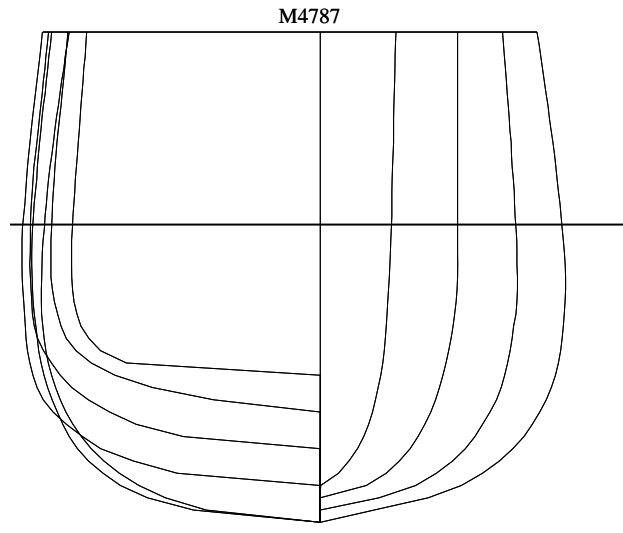


Figure 1: M4787 parent hull.

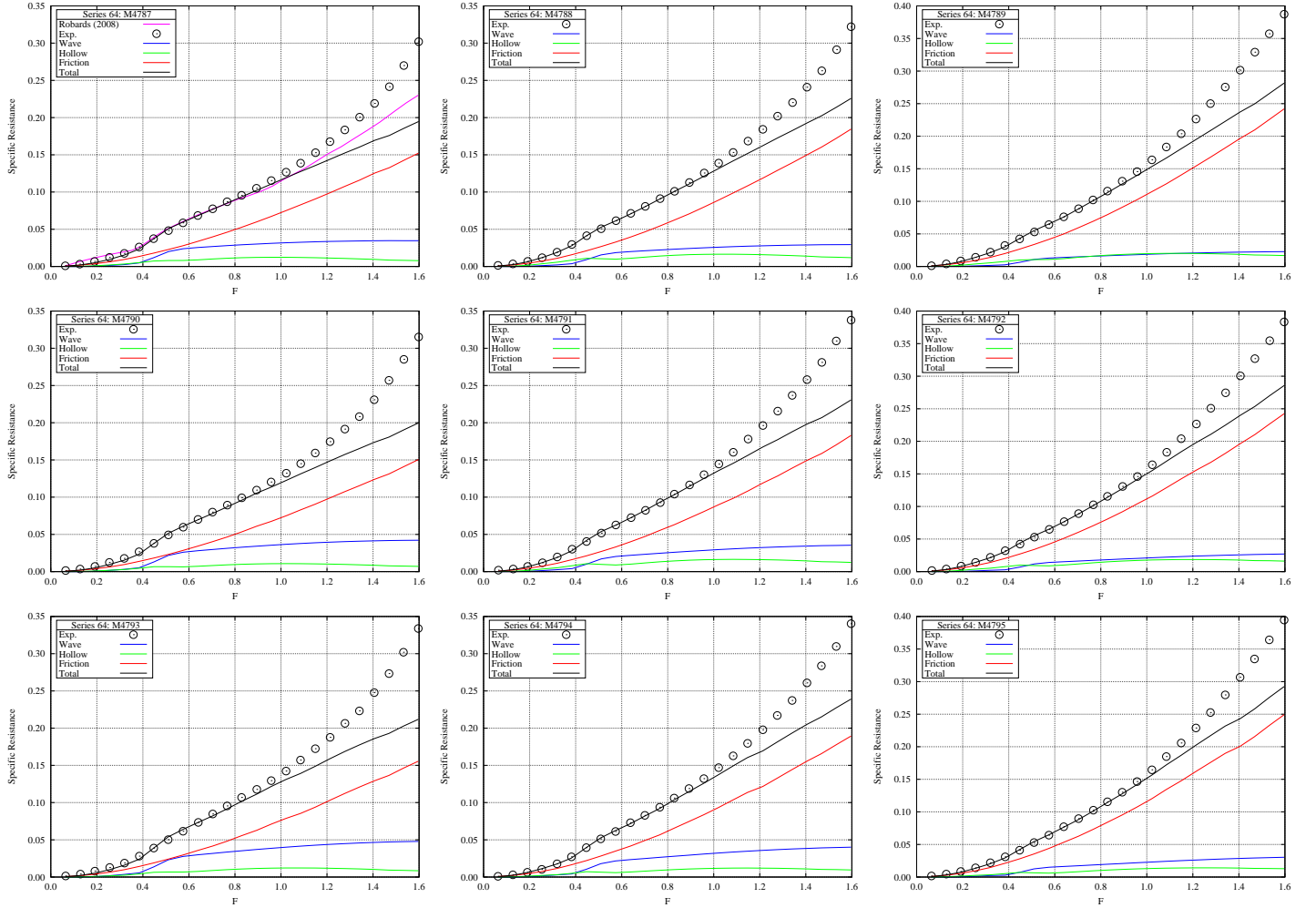


Figure 2: Total specific resistance and resistance components of Series 64 hulls having $C_B = 0.55$.

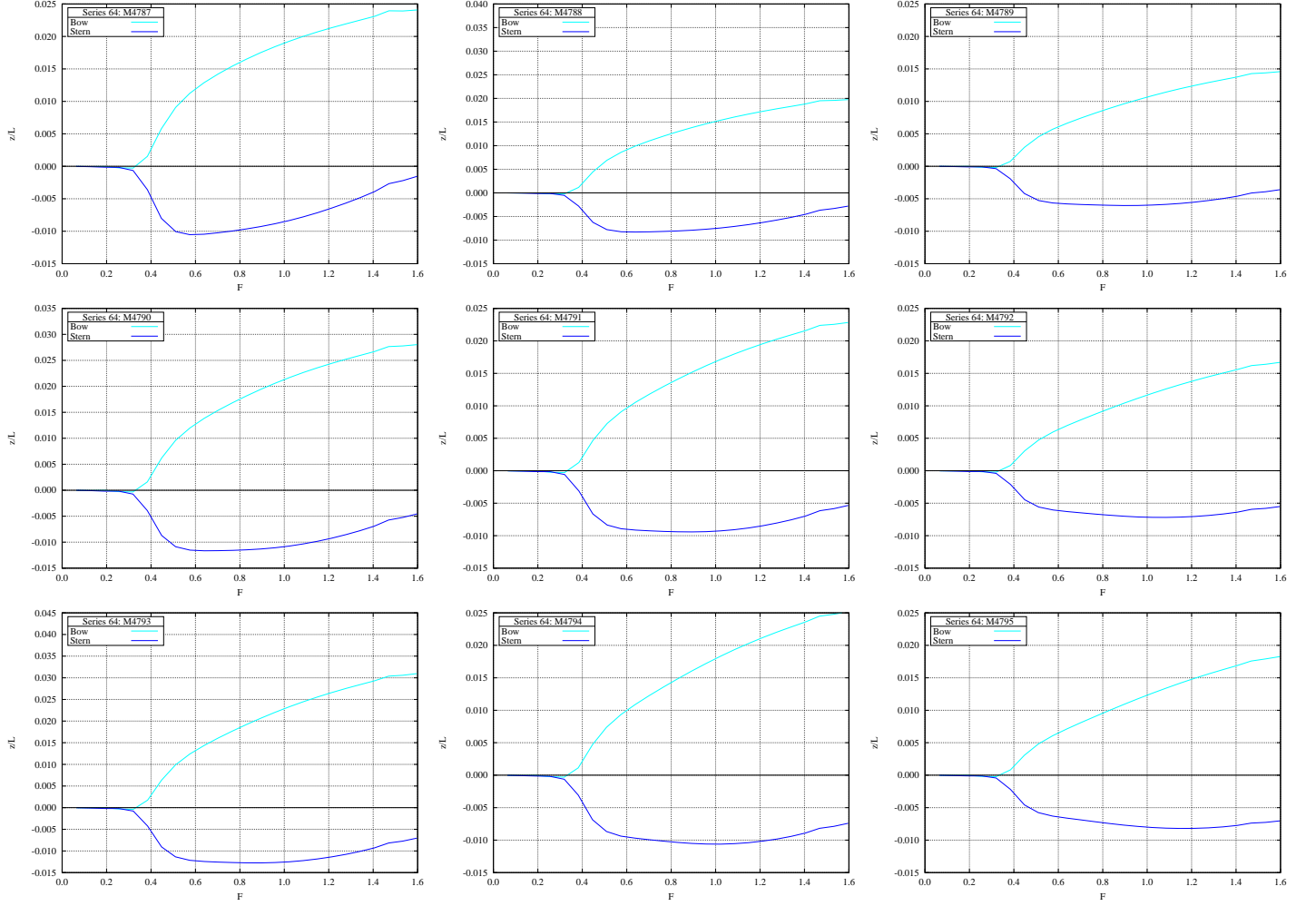


Figure 3: Squat of Series 64 hulls having $C_B = 0.55$.

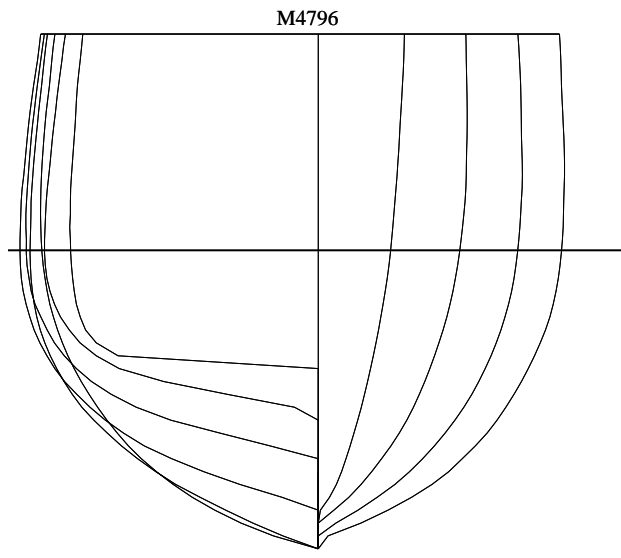


Figure 4: M4796 parent hull.

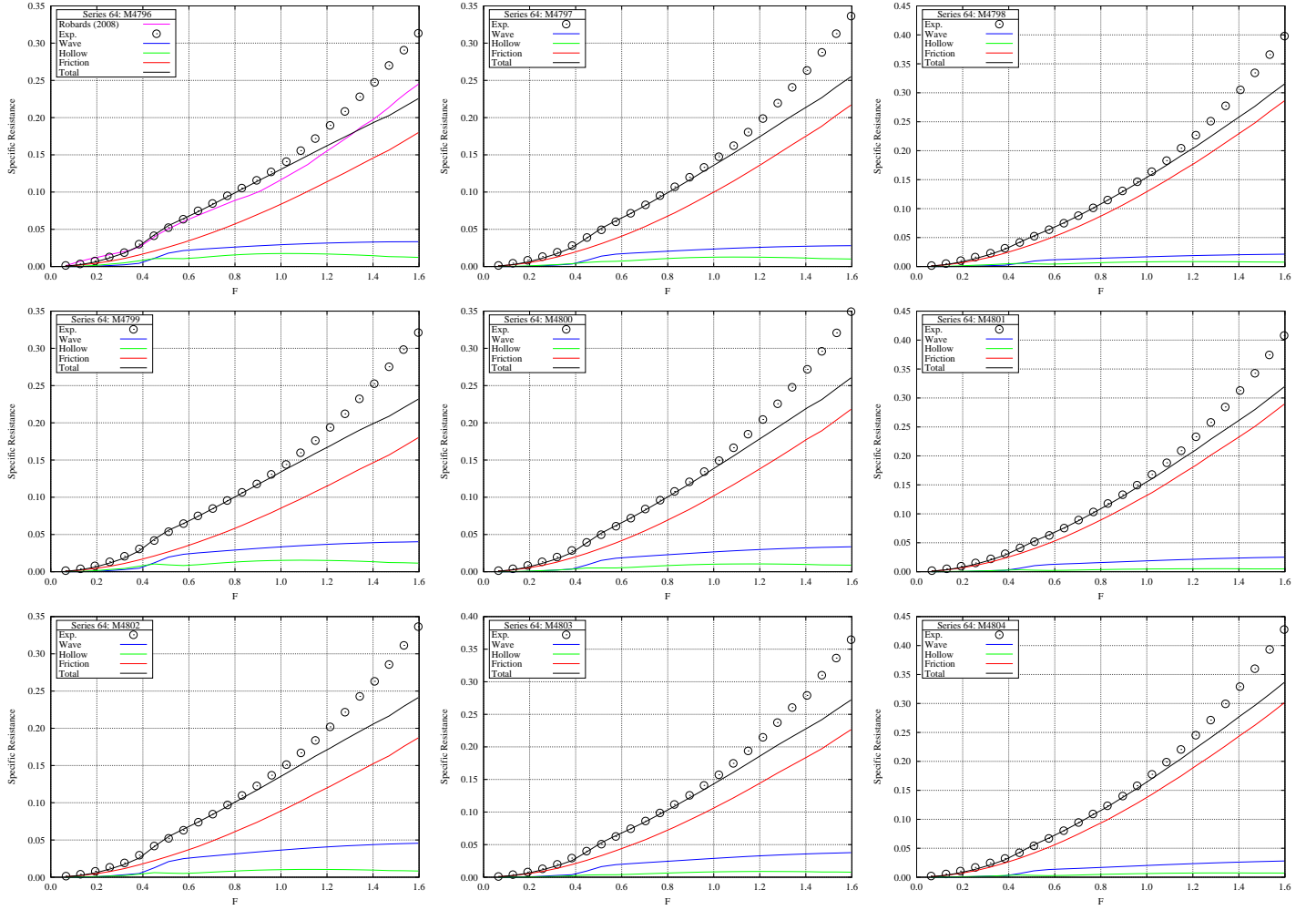


Figure 5: Total specific resistance and resistance components of Series 64 hulls having $C_B = 0.45$.

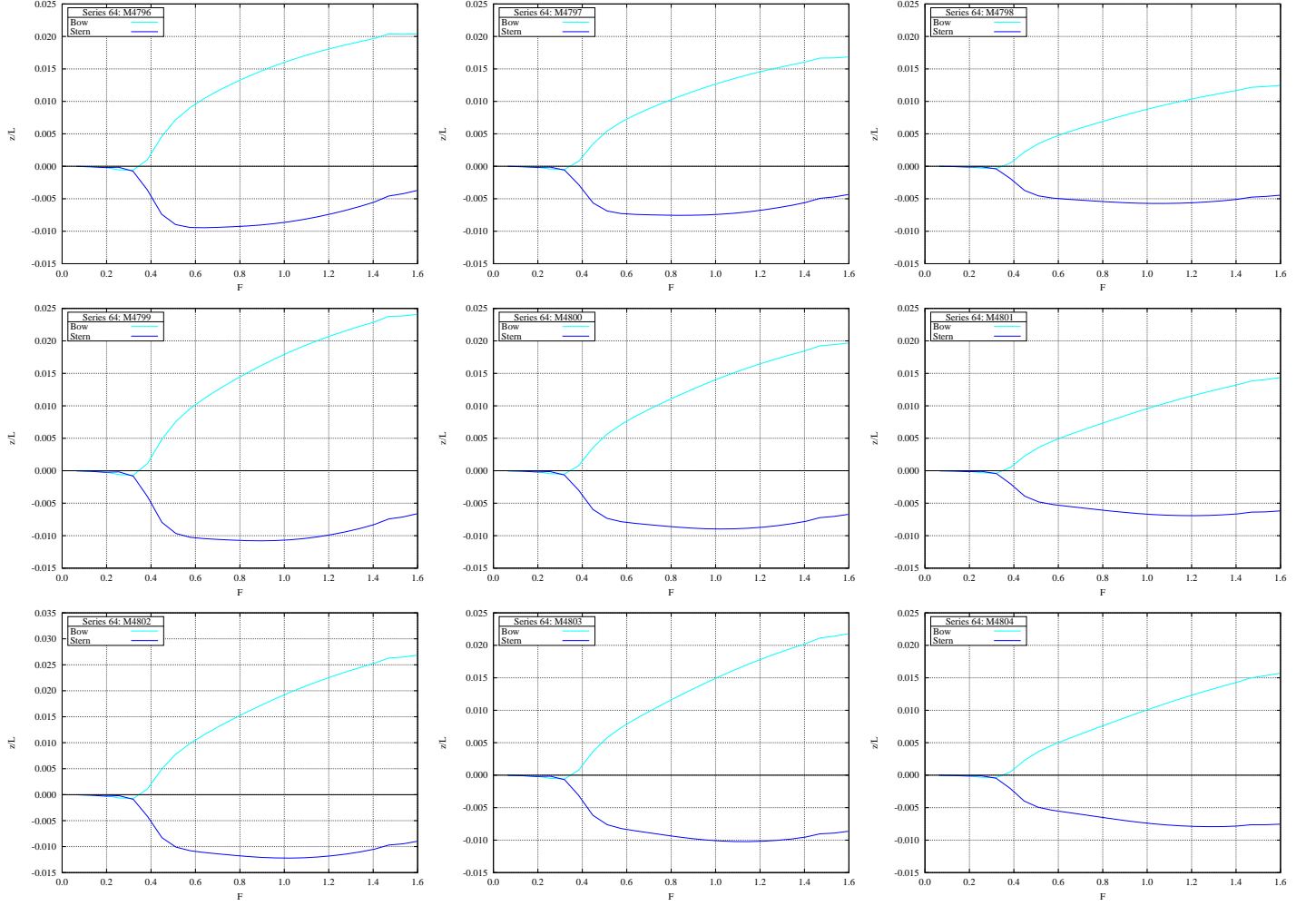


Figure 6: Squat of Series 64 hulls having $C_B = 0.45$.

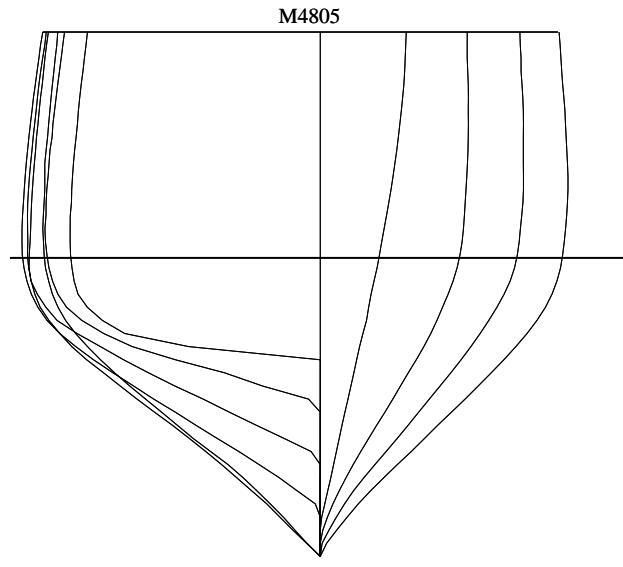


Figure 7: M4805 parent hull.

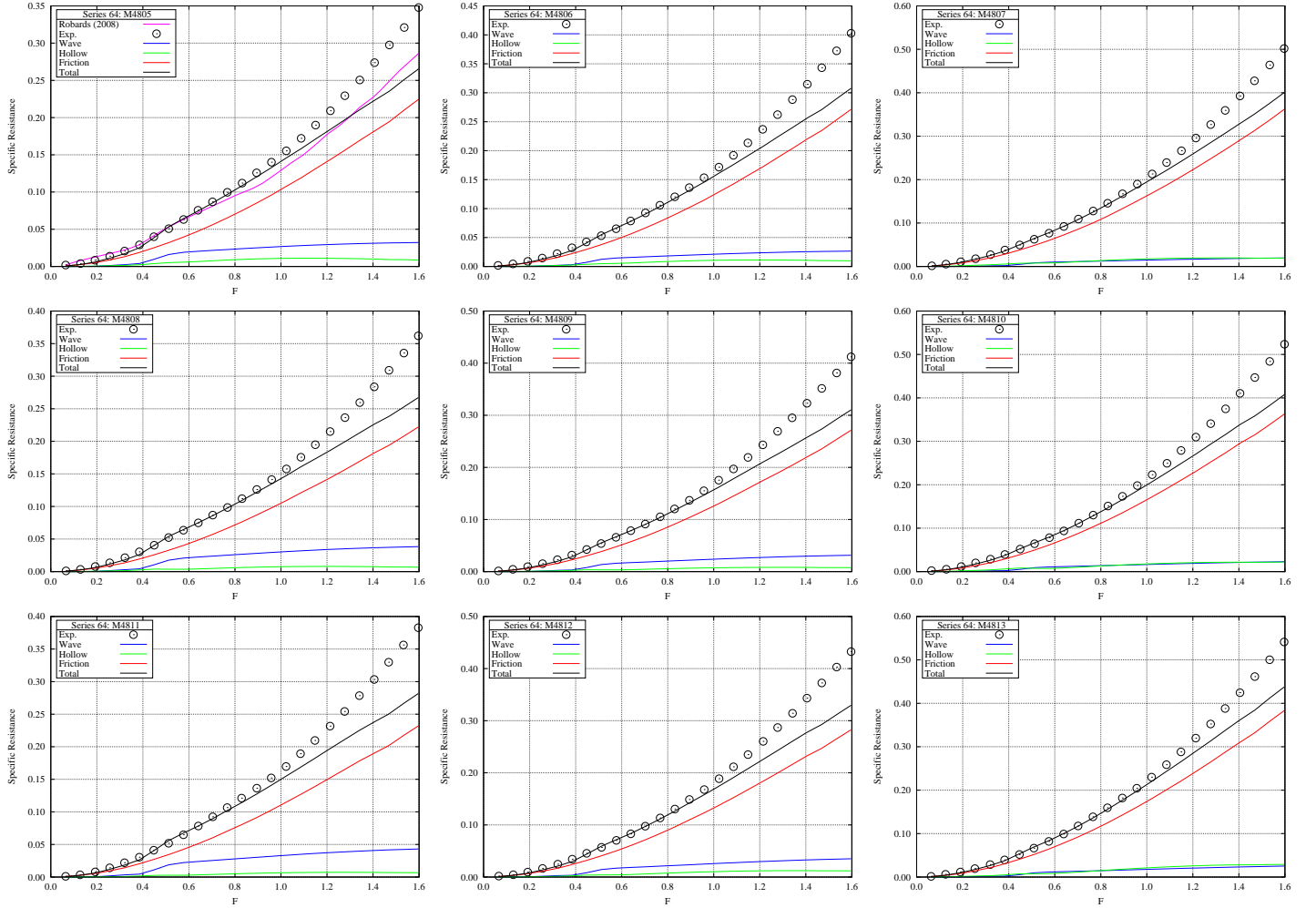


Figure 8: Total specific resistance and resistance components of Series 64 hulls having $C_B = 0.35$.

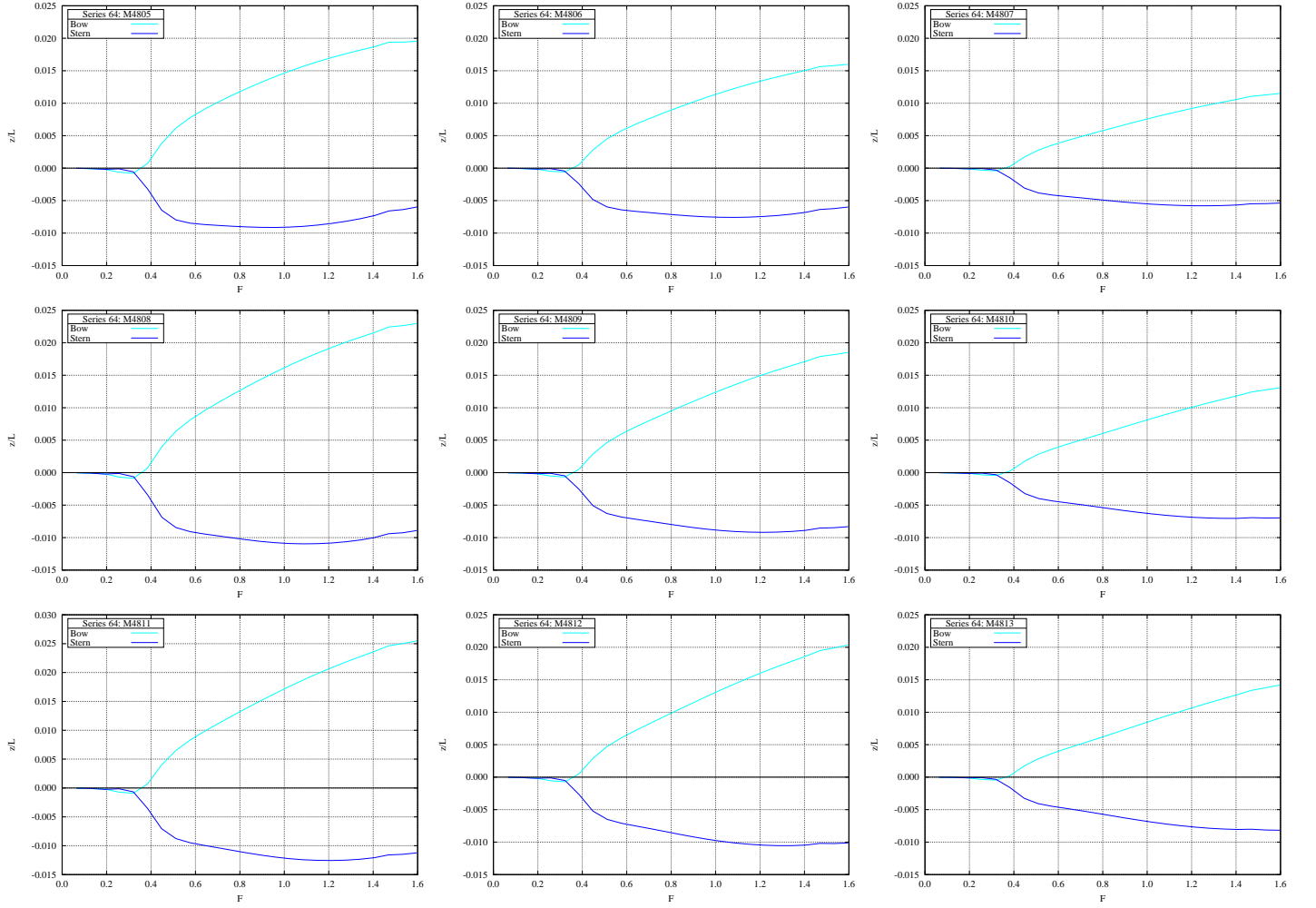


Figure 9: Squat of Series 64 hulls having $C_B = 0.35$.