

Predictions of the Resistance and Squat of the NOVA-I Hull Series

L. Lazauskas, Cyberiad, leo@cyberiad.net
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Summary

Predictions of resistance and squat of the NOVA-I hull are compared to measured values for 15 different displacements.

Geometry

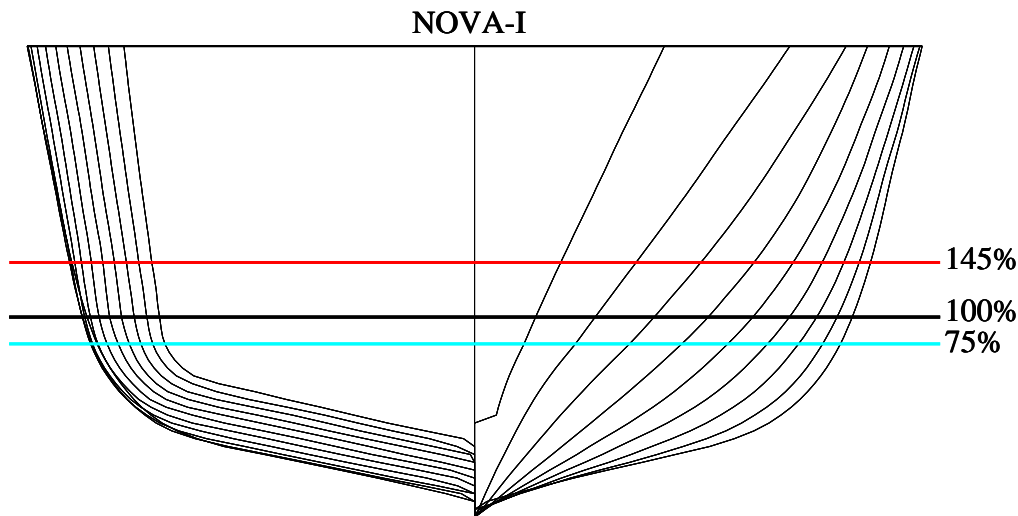


Figure 1: Body plan of the NOVA-I hull.

Notes

The performance of the NOVA series was first reported by Lahtiharju et al. [1]. Robards [2] also used the series in his thesis.

The NOVA series was developed for operation in shallow waters around Finland. The series can accommodate waterjet propulsion systems [1].

Results are presented for 15 different displacements, ranging from 75% to 145%. Lahtiharju et al. [1] did not report measured values of squat for this particular member of the NOVA series.

References

- [1] Lahtiharju, E., Karpinnen T., Hellevaara, M. and Aitta, T., “Resistance and seakeeping characteristics of fast transom stern hulls with systematically varied form”, *Trans. SNAME*, Vol. 99, 1991, pp. 85-118.
- [2] Robards, Simon William, “The hydrodynamics of high-speed transom-stern vessels”, *M. Engineering thesis*, The University of New South Wales, Nov. 2008.

	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}
75%	2.800	5.53	5.050	7.23	0.410	0.616	0.660	0.535	0.766	0.158	0.806	0.561	0.637
80%	2.800	5.50	4.900	7.07	0.420	0.626	0.667	0.545	0.770	0.161	0.807	0.576	0.655
85%	2.800	5.47	4.770	6.93	0.429	0.634	0.672	0.555	0.774	0.164	0.806	0.590	0.671
90%	2.800	5.44	4.640	6.79	0.438	0.642	0.678	0.564	0.777	0.167	0.805	0.603	0.687
95%	2.800	5.42	4.520	6.67	0.447	0.650	0.683	0.572	0.781	0.169	0.803	0.615	0.701
100%	2.800	5.41	4.470	6.62	0.450	0.653	0.684	0.575	0.782	0.171	0.802	0.620	0.706
105%	2.800	5.38	4.300	6.45	0.462	0.664	0.691	0.587	0.787	0.175	0.801	0.637	0.723
110%	2.800	5.36	4.200	6.35	0.469	0.670	0.695	0.594	0.790	0.178	0.800	0.647	0.733
115%	2.800	5.34	4.100	6.26	0.476	0.676	0.699	0.601	0.792	0.180	0.799	0.656	0.743
120%	2.800	5.32	4.010	6.17	0.482	0.682	0.702	0.607	0.795	0.183	0.798	0.664	0.751
125%	2.800	5.31	3.920	6.09	0.489	0.688	0.706	0.613	0.798	0.186	0.797	0.673	0.758
130%	2.800	5.29	3.840	6.01	0.494	0.693	0.709	0.618	0.800	0.188	0.797	0.680	0.764
135%	2.800	5.27	3.770	5.94	0.500	0.698	0.712	0.623	0.803	0.191	0.797	0.688	0.770
140%	2.800	5.26	3.690	5.87	0.506	0.702	0.715	0.628	0.805	0.193	0.797	0.695	0.775
145%	2.800	5.24	3.620	5.80	0.510	0.707	0.718	0.632	0.808	0.196	0.797	0.701	0.780

Table 1: Principal particulars of NOVA-I model hull.

	x_B/L	z_B/T	x_F/L	$1000I_L/L^4$	$1000I_T/L^4$	$\overline{\text{GM}}_{L0}/L$	$\overline{\text{GM}}_{T0}/B$
75%	0.0620	-0.319	0.078	9.08	0.294	3.42	0.553
80%	0.0630	-0.316	0.076	9.21	0.302	3.24	0.522
85%	0.0638	-0.347	0.075	9.32	0.309	3.08	0.494
90%	0.0643	-0.348	0.073	9.42	0.316	2.94	0.469
95%	0.0647	-0.317	0.071	9.52	0.322	2.81	0.445
100%	0.0649	-0.315	0.070	9.56	0.324	2.76	0.436
105%	0.0652	-0.316	0.068	9.70	0.333	2.59	0.404
110%	0.0653	-0.319	0.066	9.78	0.338	2.49	0.384
115%	0.0653	-0.321	0.065	9.86	0.343	2.41	0.368
120%	0.0652	-0.315	0.063	9.94	0.348	2.32	0.351
125%	0.0651	-0.371	0.062	10.00	0.353	2.25	0.336
130%	0.0650	-0.371	0.060	10.10	0.358	2.18	0.322
135%	0.0648	-0.373	0.059	10.20	0.363	2.12	0.308
140%	0.0645	-0.374	0.058	10.30	0.367	2.06	0.295
145%	0.0943	-0.374	0.057	10.30	0.372	2.00	0.284

Table 2: Principal hydrostatic particulars of the NOVA-I hull at 15 different displacements.

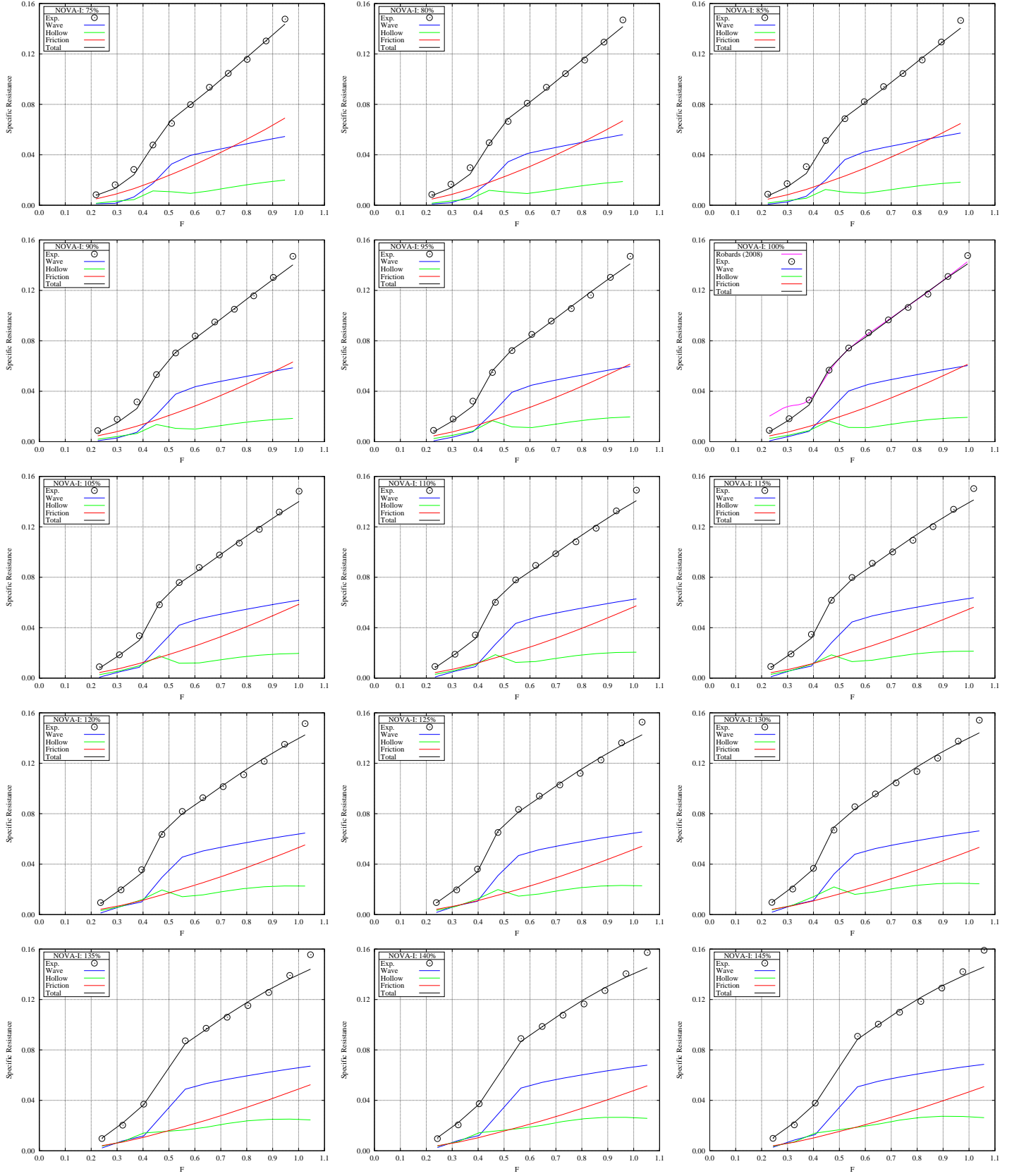


Figure 2: Total specific resistance and resistance components of the NOVA-I hull at 15 different displacements.

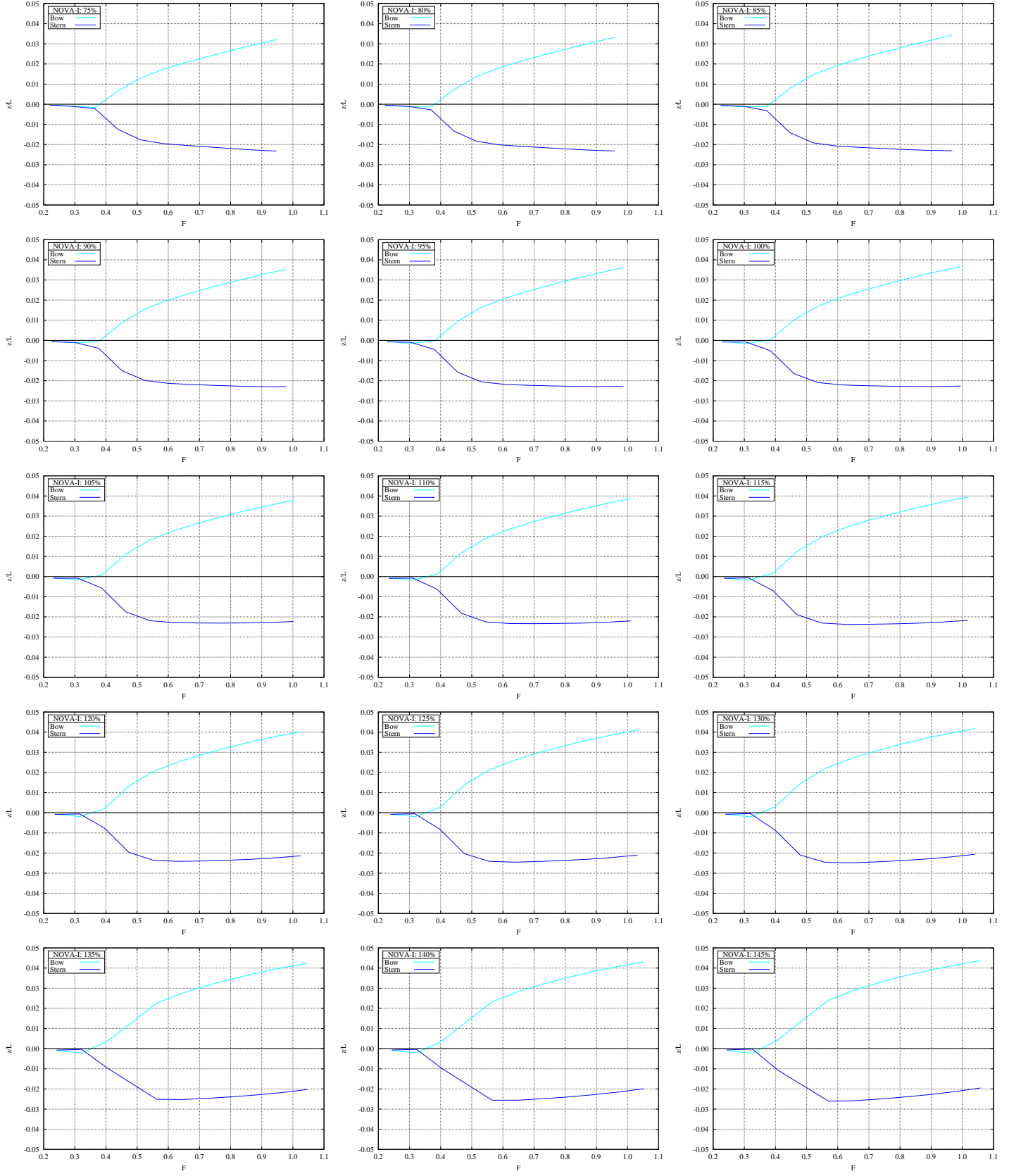


Figure 3: Predicted squat of the NOVA-I hull at 15 different displacements.