Program of resistance prediction for cargo ships by Hollenbach-1998 method (NUoS, Ukraine).

Project : 船舶设计原理
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Comment : 2024年第二学期
Filename : new4.fbm

Design length : 215.17 m
Design beam : 31.840 m
Design draft : 14.110 m
Midship location : 107.58 m
Water density : 1.025 t/m^3
Appendage coefficient : 1.0021

Date : 2024/2/21
Time : 9:26:25

Input variables

General
Start speed : 14.00 kn
End speed : 15.00 kn
Water density : 1.025 t/m^3
Water viscosity : 1.1890*10^(-6) m^2/s

Hull
Length on waterline : 219.117 m
Length over surface Los : 222.08 m
Beam on waterline : 31.841 m
Draught on midship : 14.110 m
Draught on F.P. : 14.110 m
Draught on F.A. : 14.110 m
Wetted surface area : 11583.50 m^2
Waterplane area : 6365.34 m^2
Displacement : 82435.5 m^3
Longitudinal center of buoyancy : 2.467 %
Prismatic coefficient : 0.8552

Calculated variables

Cp = 0.8552
Cb = 0.8374
Cwp = 0.9123
Cm = 0.9792
Cbt = 0.0023
Am = 439.92 m^2
L/B = 6.758
Los/Lwl = 1.014
Lwl/L = 1.018
B/T = 2.257
Lwl/T = 15.529
L/V^0.333 = 4.946
Dp/Ta = 0.496
Np = 1

Cb is outside valid domain 0,601 ... 0,830
Nballast = 0

Final calculations of resistance and power by method Hollenbach-1998

Vs kn	Vms m/s	Fr -	R_f kN	R_r kN	R_T kN	Pe kW	R_T_e kN	Pe_e kW
10.56	5.434	0.118	230.4	121.5	351.9	1912.	351.9	1912.
11.13	5.723	0.125	253.9	135.1	389.0	2226.	389.0	2226.

11.69	6.013	0.131	278.6	151.0	429.6	2583.	429.6	2583.
12.25	6.302	0.137	304.2	170.0	474.2	2989.	474.2	2989.
12.81	6.591	0.144	331.0	192.5	523.5	3451.	523.5	3451.
13.38	6.881	0.150	358.8	219.1	577.9	3977.	577.9	3977.
13.94	7.170	0.156	387.7	250.6	638.3	4576.	638.3	4576.
14.50	7.459	0.162	417.6	287.6	705.1	5260.	705.1	5260.
15.95	8.205	0.179	499.4	424.6	924.0	7582.	924.0	7582.

Tb = 925.857 kN
Kdt = 1.185
Dp = 7.000 m
Z = 4
Ae/Ao = 0.390 - calculated
Ae/Ao = 0.400 - for selection of propeller diagram
P/Dp = 0.859 - by curve of propeller optimal frequency
Ke = 1.000
Wt = 0.3179
t = 0.2384
EtaR = 1.0279
EtaH = 1.1166
EtaH*EtaR = 1.1478

NOTE: Coefficients Wt, t and EtaR were calculated by formulaes of method Holtrop-1984