

Maneuvering Benchmark Data for CFD : KVLCC & KVLCC2

1. Model Ship

Ship Name	KVLCC1	KVLCC2
Scale Ratio	58.0	
Lpp(m)	5.5172	
B(m)	1.000	
T(m)	0.3586	
CB	0.8101	0.8098
LCB(fwd. +)	3.48%	3.50%

2. Flow Measurements for KVLCC1(Bare Hull)

① Test Condition

$$U_0=1.047\text{m/s}, R_n=4.6 \cdot 10^6, F_n = 0.142$$

Bare Hull : w/o rudder & propeller

Model constraints : Fixed trim, heel & heave

② Test Program : Drift Test

Drift Angle(deg) : 0, -5, -10

③ Measured Data

Velocity : u, v, w

Measured Plane : at Station 2 ($x/L=-0.4$) and A.P.($x/L=-0.5$)

wave profile along a hull

3. PMM Tests in Deep Water for KVLCC1 & KVLCC2(Bare Hull)

① Test Condition

$$U_0=1.047\text{m/s}, R_n=4.6 \cdot 10^6, F_n = 0.142$$

$$N_c=8.59$$

Bare Hull : w/o rudder & propeller

Model constraints : Fixed trim, heel & heave

③ Test Program

	U/U ₀ (non-dim.)	Prop. Revs. (non-dim.)	Rud. Angle δ (deg.)	Drift Angle β (deg.)	Sway Acc. (non-dim.)	Yaw vel. (non-dim.)
Static drift	1.0	-	-	-6, -5, -4, -2, 0, 2, 4, 5, 6, 8, 10, 12, 16, 20, 24	-	-
Pure Yaw	1.0	-	-	0	-	0.15, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7

④ Measured Data

X, Y, N,

4. PMM Tests in Deep Water for KVLCC1 & KVLCC2

① Test Condition

$U_0=1.047\text{m/s}$, $Rn=4.6*10^6$, $Fn = 0.142$

Hull w/ rudder & propeller

Model constraints : Fixed heel, Free trim & heave

② Test Program

	U/U ₀ (non-dim.)	Prop. Revs. (non-dim.)	Rud. Angle δ (deg.)	Drift Angle β (deg.)	Sway Acc. (non-dim.)	Yaw vel. (non-dim.)
Static Rudder	0.333	1.0	-15.5~34.,1	0	0	0
	0.500	1.0	-15.3~34.,2	0	0	0
	0.667	1.0	-15.4~34.,1	0	0	0
	1.000	1.0	-15.3~34.,1	0	0	0
Static drift	0.5	1.0	0	-24, -20, -16,	0	0
	0.667	1.0	0	-12, -8, -6,	0	0
	0.667	1.0	0	-4, -2, 0, 2,4, 6, 8, 10, 12, 16,20, 24	0	0
Drift & Rudder	0.667	1.0	4.8, 10.2, 14.6	-24	0	0
	0.667	1.0	5.1, 10.1, 15.0	-20	0	0
	0.667	1.0	4.8, 10.0, 14.9	-16	0	0
	0.667	1.0	-0.2, 4.9, 10.0	-12	0	0
	0.667	1.0	-0.1, 5.0, 9.7	-10	0	0
	0.667	1.0	-0.1, 4.8, 9.8	-8	0	0
	0.667	1.0	-0.1, 4.9, 10.0	-6	0	0
	0.667	1.0	-0.1, 0.2, 4.9, 10.0	-4	0	0
	0.667	1.0	0.0, 4.9, 10.0	-2	0	0
	0.667	1.0	0.0, 4.9, 10.0	0	0	0
	0.667	1.0	0.0, 4.9, 10.0	2	0	0
	0.667	1.0	-5.2, 0.0, 5.1	4	0	0
	0.667	1.0	-5.2, 0.1, 4.8	6	0	0
	0.667	1.0	-0.1, -5.0, -10.2	8	0	0
	0.667	1.0	0.1, -5.3, -10.2	12	0	0
	0.667	1.0	-5.0, -10.2, -14.8	14	0	0
	0.667	1.0	-4.9, -10.2, -15.5	16	0	0
0.667	1.0	-5.4, -10.2, -15.0	20	0	0	
0.667	1.0	-5.4, -10.3, - 15.1	24	0	0	
Pure Sway	1.0	1.0	0	0	-0.04, -0.08, -0.12, -0.16	0

Pure Yaw	0.5	1.0	0	0	0	0.2, 0.3, 0.4, 0.5, 0.6, 0.7
	0.667	1.0	0	0	0	0.15, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7
	1.0	1.0	0	0	0	0.15, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7
Yaw with Drift	0.667	1.0	0	4, 8, 12, 16	0	0.15, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7

③ Measured Data

X, Y, N, Rx, Ry, Tx