Table 1- Submissions for KCS resistance test and seakeeping in calm water and head waves at Fr=0.26

No	Institute	Code	Turbulence	Free Surface	Discretization	Grid motion	Grid type	Grid size	No .CPU	CPU Time
1	FORCE	StarCCM+	k-ε/k-ω SST	VOF	Finite Vol.	Dynamic Overset	Unstructured	18 -28 M	NA	NA
2	HSVA	FreSCo+	k-ε/k-ω	VOF	Finite Vol.	Dynamic	Unstructured	NA	NA	NA
3	IIHR	CFDShip-Iowa V4.5	k-ε/k-ω SST	LS Single Ph.	Finite Dif.	Dynamic Overset	Structured	29.2 M	224	16128 CPUh
4	KRISO	WAVIS	k-ε/k-ω EARSM	LS	Finite Vol.	Dynamic	Structured	10 M Half B.	38	170.3 CPUh
5	MARIC	FINEMarine	k-ε/k-ω SST	VOF	Finite Vol.	Deforming	Unstructured	1.18-6.9M	NA	NA
6	NMRI	NAGISA	k-ε/k-ω EARSM	LS	Finite Vol.	Deforming	Unstructured	4.4 M	2	250 CPUh
7	NUMECA	ISISCFD	k-ε/k-ω SST	VOF	Finite Vol.	Deforming, Overset	Unstructured	2M Half B.	NA	3116 CPUh
8	UDE	OpenFOAM	k-ε/k-ω SST	VOF	Finite Vol.	Deforming	Unstructured	1.06 M	8	104 CPUh
9	UM	OF23x	k-ε/k-ω SST	VOF	Finite Vol.	Dynamic	Unstructured	2.6 M	48	3800 CPUh
10	UNIZAG-FSB	swenseFoam	k-ε/k-ω SST	LS	Finite Vol.	Dynamic	Unstructured	0.61-1.6 M	40	817 CPUh
Ave.								**9.80 M**	**60**	**3484**
G2010 (6 sub.)								**2.62 M (0.55-7.6 M)**		

Table 2- Mean and SD of submission values for KCS calm water resistance at Fr=0.26

	$C_T \times 10^3$	Sinkage/L_{pp}	Trim (deg)
$\bar{S}$	3.8500	-0.0019	-0.1686
SD%$\bar{S}$	2.67	2.93	5.36

Table 3- Mean and SD of submission values for 0th amplitude of motions and resistance for KCS seakeeping at Fr=0.26

	Cases	$C_T \times 10^3$	AR	Heave/A	Pitch/Ak	Ave.
$\bar{S}$	λ/L=0.65	8.488	4.488	-0.738	-0.107	
	λ/L=0.85	9.508	6.666	-0.575	-0.131	
	λ/L=1.15	14.783	10.723	-0.267	-0.007	
	λ/L=1.37	14.512	7.030	-0.324	-0.020	
	λ/L=1.95	11.198	2.103	-0.188	-0.058	
SD%$\bar{S}$	λ/L=0.65	6.20	49.31	10.79	13.85	**20.04**
	λ/L=0.85	5.15	24.70	11.59	86.01	**31.86**
	λ/L=1.15	10.11	20.14	23.04	228.66	**70.49**
	λ/L=1.37	11.62	24.52	102.38	114.81	**63.33**
	λ/L=1.95	6.87	24.14	14.27	21.55	**16.71**
	Ave.	**7.99**	**28.56**	**32.41**	**92.98**	**40.49**

Table 4- Mean and SD of submission values for 1st harmonic amplitudes and phases for KCS seakeeping at Fr=0.26

		ζ/L	$C_T \times 10^3$		Heave/A		Pitch/Ak		**Ave.**	
	Cases	Amp	Amp	Phase	Amp	Phase	Amp	Phase	Amp	Phase
$\bar{S}$	λ/L=0.65	0.005	2.743	-0.992	0.117	1.129	0.011	0.858		
	λ/L=0.85	0.006	3.997	-0.760	0.215	1.109	0.218	2.028		
	λ/L=1.15	0.010	3.126	-1.573	0.889	1.068	0.705	-2.591		
	λ/L=1.37	0.012	10.856	-1.240	0.884	-2.348	0.906	-1.631		
	λ/L=1.95	0.016	22.094	-0.324	0.892	-1.716	1.062	-0.585		
SD%$\bar{S}$	λ/L=0.65	2.30	13.68	5.64	12.19	107.86	83.44	41.59	**27.90**	**51.69**
	λ/L=0.85	1.77	9.50	35.33	23.23	133.23	17.93	8.08	**13.10**	**58.88**
	λ/L=1.15	2.22	5.47	20.58	11.55	253.86	9.60	5.56	**7.21**	**93.33**
	λ/L=1.37	2.83	18.48	12.99	8.53	4.64	10.19	8.99	**10.01**	**8.87**
	λ/L=1.95	2.10	7.67	53.79	6.18	11.24	6.62	28.96	**5.64**	**31.33**
	Ave.	2.25	10.96	25.67	12.33	102.17	25.55	18.63	**12.77**	**48.82**

Table 5- Mean and SD of submission values for 2nd harmonic amplitudes and phases for KCS seakeeping at Fr=0.26

		$C_T \times 10^3$		Heave/A		Pitch/Ak		**Ave.**	
	Cases	Amp	Phase	Amp	Phase	Amp	Phase	Amp	Phase
$\bar{S}$	λ/L=0.65	0.286	-0.564	0.003	2.022	0.002	2.119		
	λ/L=0.85	0.568	-0.753	0.007	-1.823	0.004	-1.259		
	λ/L=1.15	2.580	0.289	0.015	-0.184	0.014	0.289		
	λ/L=1.37	2.074	0.109	0.105	0.551	0.015	0.623		
	λ/L=1.95	0.892	-0.668	0.019	1.053	0.036	1.279		
SD%$\bar{S}$	λ/L=0.65	40.74	103.80	103.85	62.30	86.53	24.61	**77.04**	**63.57**
	λ/L=0.85	23.69	166.25	38.42	104.90	65.64	175.48	**42.59**	**148.88**
	λ/L=1.15	25.49	570.03	37.06	321.03	15.68	336.35	**26.07**	**409.14**
	λ/L=1.37	37.92	3974.68	263.14	129.64	57.58	56.56	**119.6**	**1387.0**
	λ/L=1.95	48.45	156.46	10.61	45.14	21.94	117.07	**27.00**	**106.23**
	Ave.	**35.26**	**994.24**	**90.62**	**132.60**	**49.47**	**142.02**	**58.45**	**422.95**

Table 6- Comparison error for KCS calm water resistance test submissions at Fr=0.26

No	Institute	Code	$C_T \times 10^3$	Sinkage/L_{pp}	Trim (deg)	Ave.
	FORCE	*Experiment*	*3.835*[+]	*-2.074E-03*	*-0.1646*	
1	FORCE	StarCCM[+]	2.45	13.06	4.39	**6.63**
2	HSVA	FreSCo[+]	-3.13	4.42	2.48	**3.34**
3	IIHR	CFDShip-Iowa	-0.26	9.43	-9.21	**6.30**
4	KRISO	WAVIS	2.53	4.73	-4.83	**4.03**
5	MARIC	FINEMarine31_3	-0.02	-0.20	-15.60	**3.17**
6	NMRI	NAGISA	-3.86	5.84	0.11	**3.27**
7	NUMECA	ISISCFD	-1.64	5.98	-3.17	**3.60**
8	UDE	OpenFOAM	2.74			**2.74**
9	UM	OF23x	2.01	8.18	-10.58	**6.92**
10	UNIZAG-FSB	swenseFoam	-4.70	8.06	-6.59	**6.45**
Based on Actual Errors						
Ave E%D*			**-0.39**	**7.11**	**-2.46**	**3.32**
SD E%D			**2.68**	**2.72**	**5.49**	**3.63**
G2010 Ave E%D at Fr=0.26 (All Fr)[++]			**-2.55 (-2.02)**	**3.67 (-20.31)**	**-0.24 (-10.87)**	**2.15 (11.06)**
G2010 SD E%D at Fr=0.26 (All Fr)			**3.25 (3.46)**	**2.20 (6.10)**	**3.93 (9.11)**	**3.12 (6.22)**
G2010 Ave E%D for Fr>0.2 (Fr<0.2)			**-2.37 (-1.42)**	**0.18 (-40.80)**	**0.80 (-22.52)**	**1.16 (21.58)**
G2010 SD E%D for Fr>0.2 (Fr<0.2)			**3.21 (3.80)**	**2.65 (9.54)**	**4.38 (13.84)**	**3.41 (9.06)**
Based on Absolute Errors						
Ave |E|%D			**2.33**	**7.11**	**5.18**	**4.87**
SD |E|%D			**1.38**	**2.72**	**3.08**	**2.39**
G2010 Ave |E|%D at Fr=0.26 (All Fr) [++]			**3.03 (3.25)**	**4.33 (22.34)**	**3.46 (15.98)**	**3.61 (13.86)**
G2010 SD |E|%D at Fr=0.26 (All Fr)			**2.83 (2.64)**	**1.46 (5.80)**	**2.34 (7.37)**	**2.21 (5.27)**
G2010 Ave |E|%D for Fr>0.2 (Fr<0.2)			**3.11 (3.36)**	**3.88 (40.80)**	**4.82 (27.14)**	**3.94 (23.77)**
G2010 SD |E|%D for Fr>0.2 (Fr<0.2)			**2.87 (2.51)**	**2.05 (9.54)**	**2.72 (12.03)**	**2.54 (8.03)**

$* \; E\%D = 100 \times (D - S)/D$ where D and S are data and simulation values.

[+] Resistance coefficient is based on wetted surface area (S/L^2) = 0.1818 with rudder in calm water

[++]Case 2.2b reported in Chapter 2 for KCS calm water resistance with free to sinkage and trim (6 submissions)

Table 7- Comparison error for 0^{th} harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and $\lambda/L=0.65$

No	Institute	Code	$C_{T0} \times 10^3$	AR	z_0/A	θ_0/Ak	Ave.
	FORCE	*Experiment*	8.237	3.386	-0.8097	-0.1079	
1	FORCE	StarCCM+	3.89	23.32	13.43	5.96	11.65
2	HSVA	FreSCo+	-4.13	-17.75	5.03	-3.67	7.65
3	IIHR	CFDShip-Iowa V4.5	-1.87	-23.65	9.01	-5.23	9.94
4	KRISO	WAVIS	1.30	-15.42	6.33	-0.94	5.99
5	MARIC	FINEMarine31_3	0.33	5.05	13.05	34.21	13.16
6	NMRI	NAGISA	-14.00	-151.31	2.33	-16.38	46.00
7	NUMECA	ISISCFD	0.47	28.99	6.94	-5.50	10.48
8	UDE	OpenFOAM	-2.93	-20.36	32.56		18.62
9	UM	OF23x	2.42	7.99	8.17	-10.89	7.37
10	UNIZAG	swenseFoam	-15.91	-167.65	-8.47	6.89	49.73
Ave E%D			**-3.04**	**-33.08**	**8.84**	**0.49**	**11.36**
SD E%D			**6.39**	**65.62**	**9.84**	**13.78**	**23.91**
Ave |E|%D			**4.72**	**46.15**	**10.53**	**9.96**	**17.84**
SD |E|%D			**5.27**	**57.19**	**8.00**	**9.54**	**20.00**

Table 8- Comparison error for 0^{th} harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and $\lambda/L=0.85$

No	Institute	Code	$C_{T0} \times 10^3$	AR	z_0/A	θ_0/Ak	Ave.
	FORCE	*Experiment*	9.269	6.102	-0.6279	-0.1302	
1	FORCE	StarCCM+					
2	HSVA	FreSCo+	-1.51	6.21	6.34	26.08	10.04
3	IIHR	CFDShip-Iowa V4.5	-8.19	-46.26	14.10	33.75	25.58
4	KRISO	WAVIS	-3.01	-29.59	8.05	35.51	19.04
5	MARIC	FINEMarine31_3	3.71	21.58	10.34	41.64	19.32
6	NMRI	NAGISA	-8.99	-33.63	3.77	19.53	16.48
7	NUMECA	ISISCFD	0.52	10.86	8.76	26.28	11.60
8	UDE	OpenFOAM	3.64	28.96	27.06	-245.54	76.30
9	UM	OF23x	1.70	0.21	12.59	23.67	9.54
10	UNIZAG	swenseFoam	-11.01	-41.26	-15.82	31.45	24.88
Ave E%D			**-2.57**	**-9.21**	**8.35**	**-0.85**	**5.25**
SD E%D			**5.28**	**26.97**	**10.62**	**86.74**	**32.40**
Ave |E|%D			**4.70**	**24.29**	**11.87**	**53.72**	**23.64**
SD |E|%D			**3.53**	**14.92**	**6.45**	**68.11**	**23.25**

Table 9- Comparison error for 0^{th} harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and $\lambda/L=1.15$

No	Institute	Code	$C_{T0} \times 10^3$	AR	z_0/A	θ_0/Ak	Ave.
	FORCE	*Experiment*	14.164	9.911	-0.2779	-0.0022	
1	FORCE	StarCCM+	1.39	0.13	10.48	445.93	114.48
2	HSVA	FreSCo+	-1.59	0.22	2.78	57.51	15.53
3	IIHR	CFDShip-Iowa V4.5	-26.83	-58.22	17.92	253.38	89.09
4	KRISO	WAVIS	14.41	28.45	15.47	-2157.21	553.88
5	MARIC	FINEMarine31_3	1.61	3.53	19.41	-549.83	143.59
6	NMRI	NAGISA	-16.91	-32.32	-15.39	-178.50	60.78
7	NUMECA	ISISCFD	-1.85	-2.09	11.39	237.67	63.25
8	UDE	OpenFOAM	-2.38	-3.25	21.21		8.94
9	UM	OF23x	-3.77	-10.59	12.56	36.30	15.81
10	UNIZAG	swenseFoam	-7.89	-11.54	-54.96	-145.99	55.09
Ave E%D			**-4.38**	**-8.57**	**4.09**	**-222.30**	**59.83**
SD E%D			**10.56**	**21.87**	**22.10**	**736.99**	**197.88**
Ave |E|%D			**7.86**	**15.03**	**18.16**	**451.37**	**123.10**
SD |E|%D			**8.29**	**18.04**	**13.24**	**623.57**	**165.79**

Table 10- Comparison error for 0^{th} harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and $\lambda/L=1.37$

No	Institute	Code	$C_{T0} \times 10^3$	AR	z_0/A	θ_0/Ak	Ave.
	FORCE	*Experiment*	13.948	6.512	-0.2491	-0.0075	
1	FORCE	StarCCM+	-0.37	-3.82	19.15	124.81	37.04
2	HSVA	FreSCo+	-4.78	-6.80	13.24	26.43	12.81
3	IIHR	CFDShip-Iowa V4.5	-22.81	-50.38	19.62	-75.67	42.12
4	KRISO	WAVIS	17.74	36.32	72.73	-909.06	258.96
5	MARIC	FINEMarine31_3	-13.73	-30.47	-399.50	-220.97	166.17
6	NMRI	NAGISA	12.36	32.18	5.20	-377.45	106.80
7	NUMECA	ISISCFD	-3.50	-5.77	18.62	112.14	35.01
8	UDE	OpenFOAM					
9	UM	OF23x	-7.18	-18.42	19.42	44.07	22.27
10	UNIZAG	swenseFoam	-14.13	-25.66	-40.55	-243.25	80.90
Ave E%D			**-4.04**	**-8.09**	**-30.23**	**-168.77**	**52.78**
SD E%D			**12.09**	**26.51**	**133.33**	**308.58**	**120.13**
Ave |E|%D			**10.73**	**23.31**	**67.56**	**237.09**	**84.67**
SD |E|%D			**6.88**	**14.99**	**118.85**	**259.80**	**100.13**

Table 11- Comparison error for 0^{th} harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and $\lambda/L=1.95$

No	Institute	Code	$C_{T0} \times 10^3$	AR	z_0/A	θ_0/Ak	Ave.
	FORCE	*Experiment*	10.798	1.909	-0.2004	-0.0571	
1	FORCE	StarCCM+	4.09	8.13	8.96	-0.55	5.43
2	HSVA	FreSCo+	-1.93	1.00	4.05	-5.44	3.11
3	IIHR	CFDShip-Iowa V4.5	-14.39	-49.07	13.46	-10.27	21.80
4	KRISO	WAVIS	1.98	0.63	19.26	-34.20	14.02
5	MARIC	FINEMarine31_3	-16.75	-64.04	14.18	47.42	35.60
6	NMRI	NAGISA	2.85	19.29	8.09	-23.56	13.45
7	NUMECA	ISISCFD	3.14	14.86	23.35	-11.10	13.11
8	UDE	OpenFOAM	-1.45	-0.98	-9.77		4.07
9	UM	OF23x	-9.02	-36.07	2.64	0.38	12.02
10	UNIZAG	swenseFoam	-5.57	-7.70	-24.37	14.74	13.09
Ave E%D			**-3.70**	**-11.40**	**5.99**	**-2.51**	**5.90**
SD E%D			**7.12**	**26.89**	**13.41**	**22.09**	**17.38**
Ave |E|%D			**6.12**	**20.18**	**12.81**	**16.41**	**13.88**
SD |E|%D			**5.20**	**21.12**	**7.18**	**15.01**	**12.13**

Table 12- Average comparison error $E\%D$ for 0^{th} harmonic of resistance and motions over five wavelength conditions (λ/L=0.65, 0.85, 1.15, 1.37, 1.95) for KCS seakeeping submissions at Fr=0.26

No	Institute	Code	C_{T0}	AR	z_0/A	θ_0/Ak	Ave E%D
1	FORCE	StarCCM+	2.25	6.94	13.01	144.04	41.56
2	HSVA	FreSCo+	-2.79	-3.42	6.29	20.18	8.17
3	IIHR	CFDShip-Iowa V4.5	-14.82	-45.52	14.82	39.19	28.59
4	KRISO	WAVIS	6.48	4.08	24.37	-613.18	162.03
5	MARIC	FINEMarine31_3	-4.97	-12.87	-68.50	-129.51	53.96
6	NMRI	NAGISA	-4.94	-33.16	0.80	-115.27	38.54
7	NUMECA	ISISCFD	-0.24	9.37	13.81	71.90	23.83
8	UDE	OpenFOAM	-0.78	1.09	17.77	-245.54	66.29
9	UM	OF23x	-3.17	-11.37	11.08	18.71	11.08
10	UNIZAG	swenseFoam	-10.90	-50.76	-28.83	-67.23	39.43
Ave E%D			**-3.39**	**-13.56**	**0.46**	**-87.67**	**26.27**
SD E%D			**5.82**	**20.90**	**26.78**	**205.48**	**64.75**
G2010 Ave E%D (6 submissions*)			**5.57**	**NA**	**-3.14**	**123.26**	**43.99**
G2010 SD E%D (6 submissions*)			**24.13**	**NA**	**15.63**	**142.49**	**60.75**

* Averaged over KCS seakeeping cases reported in Chapter 4 with (λ/L, Fr) of (1.1, 0.26), (1.33, 0.26), and (2.00, 0.33)

Table 13- Average comparison error $|E|\%D$ for 0^{th} harmonic of resistance and motions over five wavelength conditions (λ/L=0.65, 0.85, 1.15, 1.37, 1.95) for KCS seakeeping submissions at Fr=0.26

No	Institute	Code	C_{T0}	AR	z_0/A	θ_0/Ak	Ave |E|%D
1	FORCE	StarCCM+	2.43	8.85	13.01	144.31	42.15
2	HSVA	FreSCo+	2.79	6.40	6.29	23.83	9.83
3	IIHR	CFDShip-Iowa V4.5	14.82	45.52	14.82	75.66	37.70
4	KRISO	WAVIS	7.69	22.08	24.37	627.38	170.38
5	MARIC	FINEMarine31_3	7.22	24.94	91.30	178.81	75.57
6	NMRI	NAGISA	11.02	53.75	6.95	123.08	48.70
7	NUMECA	ISISCFD	1.89	12.52	13.81	78.54	26.69
8	UDE	OpenFOAM	2.60	13.39	22.65	245.54	71.04
9	UM	OF23x	4.82	14.66	11.08	23.06	13.40
10	UNIZAG	swenseFoam	10.90	50.76	28.83	88.46	44.74
Ave |E|%D			**6.62**	**25.28**	**23.31**	**160.87**	**54.02**
SD |E|%D			**4.25**	**17.10**	**23.73**	**168.49**	**53.39**
G2010 Ave |E|%D (6 submissions*)			**19.84**	**NA**	**11.44**	**152.08**	**61.12**
G2010 SD |E|%D (6 submissions*)			**14.83**	**NA**	**11.11**	**111.21**	**45.71**

* Averaged over KCS seakeeping cases reported in Chapter 4 with (λ/L, Fr) of (1.1, 0.26), (1.33, 0.26), and (2.00, 0.33)

Table 14- Comparison error for 1st harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=0.65

No	Institute	Code	ζ_1 /L	$C_{T1}\times10^3$		z_1/A		θ_1/Ak		Ave.	
			Amp	Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	0.0051	3.348	-0.7121	0.1301	1.9065	0.0172	1.0984		
1	FORCE	StarCCM+	-0.20	25.84	3.93	15.00	4.81	17.68	-0.22	14.68	2.99
2	HSVA	FreSCo+	3.21	23.71	2.76	10.73	2.95	11.90	-0.35	12.39	2.02
3	IIHR	CFDShip-Iowa	0.29	9.72	4.68	-5.57	4.95	-19.49	7.31	8.77	5.65
4	KRISO	WAVIS	0.27	21.80	3.87	18.51	5.63	12.23	-1.35	13.20	3.62
5	MARIC	FINEMarine31_3		35.04		26.96		41.87		34.62	
6	NMRI	NAGISA	5.89	21.24	5.24	0.13	12.23	62.14	17.27	22.35	11.58
7	NUMECA	ISISCFD	-1.29	18.30	3.97	4.38	3.74	3.98	2.94	6.99	3.55
8	UDE	OpenFOAM		-9.88	5.00	-2.26	6.26			6.07	5.63
9	UM	OF23x	0.60	17.05	4.54	4.57	4.14	2.71	2.27	6.23	3.65
10	UNIZAG	swenseFoam		17.87	6.02	26.43	-33.30	176.09	2.79	73.46	14.04
Ave E%D			**1.25**	**18.07**	**4.45**	**9.89**	**1.27**	**34.35**	**3.83**	**15.89**	**3.18**
SD E%D			**2.27**	**11.21**	**0.89**	**10.98**	**12.48**	**54.78**	**5.68**	**19.81**	**6.35**
Ave |E|%D			**1.68**	**20.04**	**4.45**	**11.45**	**8.67**	**38.68**	**4.31**	**17.96**	**5.81**
SD |E|%D			**1.98**	**7.09**	**0.89**	**9.34**	**9.07**	**51.82**	**5.32**	**17.56**	**5.09**

Table 15- Comparison error for 1st harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=0.85

No	Institute	Code	ζ_1 /L	$C_{T1}\times10^3$		z_1/A		θ_1/Ak		Ave.	
			Amp	Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	0.0064	4.206	-1.2865	0.2438	0.9698	0.1462	1.3372		
1	FORCE	StarCCM+									
2	HSVA	FreSCo+	3.68	7.66	-10.99	4.53	-10.86	-50.99	-12.33	16.71	11.40
3	IIHR	CFDShip-Iowa	-0.24	-9.48	-11.94	-23.33	-7.35	-100.7	-11.22	33.44	10.17
4	KRISO	WAVIS	-0.14	6.74	-13.41	39.78	-21.07	-49.97	-11.91	24.16	15.46
5	MARIC	FINEMarine31_3		16.44		48.32		9.70		24.82	
6	NMRI	NAGISA	3.27	14.78	-6.80	18.09	-3.67	-38.53	-6.62	18.67	5.70
7	NUMECA	ISISCFD	-0.88	1.27	-11.21	5.11	-10.61	-59.50	-12.14	16.69	11.32
8	UDE	OpenFOAM	-0.24	-9.85	-3.46	11.82	-13.13	-50.50	-14.35	18.10	10.32
9	UM	OF23x	-0.37	4.90	-0.25	6.30	-9.76	-57.47	-6.81	17.26	5.61
10	UNIZAG	swenseFoam		12.24	-9.02	-4.20	-41.25	-44.58	-12.57	20.34	20.94
Ave E%D			**0.73**	**4.97**	**-8.39**	**11.83**	**-14.71**	**-49.17**	**-10.99**	**16.67**	**11.36**
SD E%D			**1.76**	**9.03**	**4.27**	**20.48**	**11.07**	**26.74**	**2.61**	**14.50**	**5.98**
Ave |E|%D			**1.26**	**9.26**	**8.39**	**17.94**	**14.71**	**51.33**	**10.99**	**19.95**	**11.36**
SD |E|%D			**1.42**	**4.51**	**4.27**	**15.40**	**11.07**	**22.33**	**2.61**	**10.92**	**5.98**

Table 16- Comparison error for 1st harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=1.15

No	Institute	Code	ζ_1 /L	$C_{T1}\times10^3$		z_1/A		θ_1/Ak		Ave.	
			Amp	Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	0.0101	3.929	-1.5459	0.8988	-3.101	0.7482	-2.495		
1	FORCE	StarCCM+	-0.18			-9.96	4.27	4.57	5.83	4.90	5.05
2	HSVA	FreSCo+	4.31			-7.13	1.61	-0.52	2.01	3.99	1.81
3	IIHR	CFDShip-Iowa	0.02	26.59	7.02	-9.11	0.93	-3.12	1.28	9.71	3.08
4	KRISO	WAVIS	-0.13			29.04	8.47	8.10	1.84	12.42	5.16
5	MARIC	FINEMarine31_3				11.77		28.09		19.93	
6	NMRI	NAGISA	5.86			-3.91	-3.41	8.15	-3.12	5.97	3.26
7	NUMECA	ISISCFD	0.00	17.44	-0.21	-4.28	0.27	-2.18	0.45	5.98	0.31
8	UDE	OpenFOAM	0.84			7.88	2.48			4.36	2.48
9	UM	OF23x	0.34			-2.16	2.00	-0.23	1.92	0.91	1.96
10	UNIZAG	swenseFoam		17.26	-5.54	-1.43	-13.66	8.69	2.09	9.13	7.10
Ave E%D			**1.38**	**20.43**	**0.42**	**1.07**	**0.33**	**5.73**	**1.54**	**7.15**	**0.76**
SD E%D			**2.19**	**4.36**	**5.15**	**11.43**	**5.78**	**9.05**	**2.29**	**6.76**	**4.41**
Ave |E|%D			**1.46**	**20.43**	**4.26**	**8.67**	**4.12**	**7.07**	**2.32**	**9.41**	**3.57**
SD |E|%D			**2.14**	**4.36**	**2.93**	**7.52**	**4.07**	**8.04**	**1.50**	**5.52**	**2.83**

Table 17- Comparison error for 1st harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=1.37

No	Institute	Code	ζ_1 /L	$C_{T1}\times10^3$		z_1/A		θ_1/Ak		Ave.	
			Amp	Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	0.0123	12.768	-1.3330	0.8745	-2.397	0.9655	-1.702		
1	FORCE	StarCCM+	-0.07	5.97	2.38	-5.27	1.21	13.46	2.14	6.19	1.91
2	HSVA	FreSCo+	4.24	12.34	-0.84	-4.30	9.83	-2.98	-0.81	5.97	3.83
3	IIHR	CFDShip-Iowa	0.16	7.72	-0.12	0.31	8.77	1.24	-1.03	2.36	3.31
4	KRISO	WAVIS	7.19	3.08	-6.80	10.44	4.39	8.26	-4.47	7.24	5.22
5	MARIC	FINEMarine31_3		51.65		-12.41		17.87		27.31	
6	NMRI	NAGISA	2.87	33.16	-3.89	16.98	13.41	23.25	-1.78	19.07	6.36
7	NUMECA	ISISCFD	-0.70	2.26	-1.16	-4.95	9.28	-4.87	-1.30	3.19	3.91
8	UDE	OpenFOAM									
9	UM	OF23x	-0.51	5.02	-0.72	-5.61	0.35	-3.40	2.33	3.64	1.13
10	UNIZAG	swenseFoam		13.56	-0.72	-5.24	11.71	2.20	-4.14	7.00	5.52
Ave E%D			**1.88**	**14.97**	**-1.48**	**-1.12**	**7.37**	**6.11**	**-1.13**	**6.02**	**3.33**
SD E%D			**2.77**	**15.71**	**2.56**	**8.63**	**4.52**	**9.57**	**2.33**	**9.17**	**3.14**
Ave |E|%D			**2.25**	**14.97**	**2.08**	**7.28**	**7.37**	**8.61**	**2.25**	**8.28**	**3.90**
SD |E|%D			**2.49**	**15.71**	**2.11**	**4.77**	**4.52**	**7.39**	**1.29**	**7.59**	**2.64**

Table 18- Comparison error for 1st harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=1.95

No	Institute	Code	ζ_1 /L	$C_{T1}\times10^3$		z_1/A		θ_1/Ak		Ave.	
			Amp	Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	0.0160	25.097	-0.6097	0.9331	-1.971	1.1194	-0.832		
1	FORCE	StarCCM+	-0.56	10.98	-6.81	6.37	-5.38	3.13	-4.81	5.26	5.66
2	HSVA	FreSCo+	0.10	8.01	-5.10	3.63	-5.06	2.91	-5.22	3.66	5.12
3	IIHR	CFDShip-Iowa	-0.75	5.59	-4.71	1.67	-4.85	2.58	-4.99	2.65	4.85
4	KRISO	WAVIS	-0.24	30.30	-6.48	20.55	-4.74	20.83	-5.51	17.98	5.58
5	MARIC	FINEMarine31_3		14.97		-1.17		-3.90		6.68	
6	NMRI	NAGISA	5.77	13.73	2.91	0.82	4.43	6.45	3.02	6.69	3.45
7	NUMECA	ISISCFD	-1.03	6.57	-5.46	3.81	-5.49	3.49	-5.52	3.72	5.49
8	UDE	OpenFOAM	-0.75	10.15	-6.22	-0.85	-5.97			3.92	6.09
9	UM	OF23x	0.00	7.77	-4.00	3.44	-3.66	3.68	-3.42	3.72	3.69
10	UNIZAG	swenseFoam		11.59	-5.13	6.10	6.73	7.23	-5.00	8.31	5.62
Ave E%D			**0.32**	**11.97**	**-4.55**	**4.44**	**-2.66**	**5.16**	**-3.93**	**5.47**	**3.72**
SD E%D			**2.09**	**6.75**	**2.77**	**5.90**	**4.48**	**6.27**	**2.70**	**5.26**	**3.32**
Ave |E|%D			**1.15**	**11.97**	**5.20**	**4.84**	**5.15**	**6.02**	**4.68**	**6.00**	**5.01**
SD |E|%D			**1.78**	**6.75**	**1.17**	**5.58**	**0.84**	**5.45**	**0.88**	**4.89**	**0.96**

Table 19- Average comparison error $E\%D$ for 1st harmonic of resistance and motions over five wavelength conditions (λ/L=0.65, 0.85, 1.15, 1.37, 1.95) for KCS seakeeping submissions at Fr=0.26

No	Institute	Code	ζ_1/L	C_{T1}		z_1/A		θ_1/Ak		Ave.	
			Amp	Amp	Phase**	Amp	Phase	Amp	Phase	Amp	Phase
1	FORCE	StarCCM+	-0.25	14.26	-0.16	1.54	1.23	9.71	0.74	6.44	0.71
2	HSVA	FreSCo+	3.11	12.93	-3.54	1.49	-0.30	-7.94	-3.34	6.37	2.40
3	IIHR	CFDShip-Iowa	-0.10	8.03	-1.01	-7.21	0.49	-23.89	-1.73	9.81	1.08
4	KRISO	WAVIS	1.39	15.48	-5.71	23.66	-1.46	-0.11	-4.28	10.16	3.82
5	MARIC	FINEMarine31_3		29.53		14.69		18.73		20.98	
6	NMRI	NAGISA	4.73	20.73	-0.63	6.42	4.60	12.29	1.75	11.04	2.33
7	NUMECA	ISISCFD	-0.78	9.17	-2.81	0.81	-0.56	-11.82	-3.11	5.64	2.16
8	UDE	OpenFOAM	-0.05	-3.19	-1.56	4.15	-2.59	-50.50	-14.35	14.47	6.17
9	UM	OF23x	0.01	8.69	-0.11	1.31	-1.39	-10.94	-0.74	5.24	0.75
10	UNIZAG	swenseFoam		14.50	-2.88	4.33	-13.95	29.93	-3.37	16.25	6.73
Ave E%D			1.01	13.01	-2.05	5.12	-1.55	-3.46	-3.16	5.65	2.25
SD E%D			1.82	8.14	1.75	8.06	4.80	21.95	4.39	9.99	3.65
G2010 Ave E%D (6 submissions*)			**NA**	**63.25**	**-17.09**	**3.16**	**-0.12**	**-1.33**	**-0.71**	**22.58**	**5.97**
G2010 SD E%D (6 submissions*)			**NA**	**28.90**	**30.29**	**12.22**	**1.61**	**5.51**	**4.85**	**15.54**	**12.25**

Table 20- Average comparison error $|E|\%D$ for 1st harmonic of resistance and motions over five wavelength conditions (λ/L=0.65, 0.85, 1.15, 1.37, 1.95) for KCS seakeeping submissions at Fr=0.26

No	Institute	Code	ζ_1/L	C_{T1}		z_1/A		θ_1/Ak		Ave.	
			Amp	Amp	Phase**	Amp	Phase	Amp	Phase	Amp	Phase
1	FORCE	StarCCM+	1.01	13.01	-2.05	5.12	-1.55	-3.46	-3.16	5.65	2.25
2	HSVA	FreSCo+	1.82	8.14	1.75	8.06	4.80	21.95	4.39	9.99	3.65
3	IIHR	CFDShip-Iowa	1.01	13.01	-2.05	5.12	-1.55	-3.46	-3.16	5.65	2.25
4	KRISO	WAVIS	1.82	8.14	1.75	8.06	4.80	21.95	4.39	9.99	3.65
5	MARIC	FINEMarine31_3	1.01	13.01	-2.05	5.12	-1.55	-3.46	-3.16	5.65	2.25
6	NMRI	NAGISA	1.82	8.14	1.75	8.06	4.80	21.95	4.39	9.99	3.65
7	NUMECA	ISISCFD	1.01	13.01	-2.05	5.12	-1.55	-3.46	-3.16	5.65	2.25
8	UDE	OpenFOAM	1.82	8.14	1.75	8.06	4.80	21.95	4.39	9.99	3.65
9	UM	OF23x	1.01	13.01	-2.05	5.12	-1.55	-3.46	-3.16	5.65	2.25
10	UNIZAG	swenseFoam	1.82	8.14	1.75	8.06	4.80	21.95	4.39	9.99	3.65
Ave |E|%D			**1.47**	**14.71**	**4.92**	**9.83**	**7.75**	**24.34**	**5.71**	**12.59**	**6.13**
SD |E|%D			**1.53**	**5.98**	**1.30**	**6.28**	**5.03**	**13.47**	**3.19**	**6.82**	**3.17**
G2010 Ave |E|%D (6 sub.*)			**NA**	**63.25**	**18.13**	**9.43**	**1.28**	**4.06**	**4.48**	**25.58**	**7.96**
G2010 SD |E|%D (6 sub.*)			**NA**	**28.90**	**29.68**	**8.39**	**0.99**	**3.96**	**1.99**	**13.75**	**10.89**

* Averaged over KCS seakeeping cases reported in Chapter 4 with (λ/L, Fr) of (1.1, 0.26), (1.33, 0.26), and (2.00, 0.33)

**Phase error is normalized by 2π ($E\%2\pi = 100 \times (D - S)/2\pi$)

Table 21- Comparison error for 2nd harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=0.65

No	Institute	Code	$C_{T2}\times10^3$		z_2/A		θ_2/Ak		Ave.	
			Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	0.652	0.0678	0.0052	-0.0463	0.0012	0.6052		
1	FORCE	StarCCM+	68.17	7.37	91.33	-37.56	32.54	-26.96	64.01	23.96
2	HSVA	FreSCo+	70.89	4.11	88.83	-47.87	29.89	-30.06	63.20	27.35
3	IIHR	CFDShip-Iowa	56.52	7.99	76.16	-31.53	22.34	-27.44	51.67	22.32
4	KRISO	WAVIS	64.95	7.84	79.87	-38.40	24.97	-27.13	56.60	24.45
5	MARIC	FINEMarine31_3	68.40		3.55		-317.68		129.88	
6	NMRI	NAGISA	26.37	9.76	-42.74	-40.68	8.11	-23.48	25.74	24.64
7	NUMECA	ISISCFD	63.12	6.46	-39.07	-38.95	-180.51	-24.86	94.23	23.42
8	UDE	OpenFOAM	16.70	1.83					16.70	1.83
9	UM	OF23x	66.59	9.62	87.86	-46.93	12.40	-29.93	55.62	28.83
10	UNIZAG	swenseFoam	59.23	35.53	86.48	18.53	37.13	-2.84	60.95	18.97
Ave E%D			**56.09**	**10.06**	**48.03**	**-32.92**	**-36.76**	**-24.09**	**46.96**	**22.36**
SD E%D			**17.89**	**9.32**	**53.97**	**20.05**	**118.33**	**8.30**	**63.40**	**12.56**
Ave |E|%D			**56.09**	**10.06**	**66.21**	**37.55**	**73.95**	**24.09**	**65.42**	**23.90**
SD |E|%D			**17.89**	**9.32**	**28.91**	**8.70**	**99.42**	**8.30**	**48.74**	**8.77**

Table 22- Comparison error for 2nd harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=0.85

No	Institute	Code	$C_{T2}\times10^3$		z_2/A		θ_2/Ak		Ave.	
			Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	0.755	-1.1217	0.0082	0.8105	0.0022	1.2154		
1	FORCE	StarCCM+								
2	HSVA	FreSCo+	40.08	27.62	41.83	-46.34	-6.45	-43.84	29.45	39.26
3	IIHR	CFDShip-Iowa	4.00	-16.90	-6.51	-42.93	-88.87	-34.04	33.13	31.29
4	KRISO	WAVIS	34.46	-16.64	40.03	-41.87	21.14	-39.96	31.88	32.82
5	MARIC	FINEMarine31_3	49.16		-57.61		-353.91		153.56	
6	NMRI	NAGISA	-8.44	-17.14	9.07	-32.06	-117.88	-35.38	45.13	28.19
7	NUMECA	ISISCFD	31.34	-21.23	14.19	-46.64	-55.19	-42.57	33.57	36.81
8	UDE	OpenFOAM	12.88	-28.95					12.88	28.95
9	UM	OF23x	38.89	3.22	41.50	-42.93	2.98	-30.31	27.79	25.49
10	UNIZAG	swenseFoam	21.17	23.02	40.36	46.11	-1.92	1.74	21.15	23.62
Ave E%D			**24.84**	**-5.88**	**15.36**	**-29.52**	**-75.01**	**-32.05**	**38.40**	**22.48**
SD E%D			**17.81**	**19.91**	**32.52**	**31.20**	**114.88**	**14.50**	**55.07**	**21.87**
Ave |E|%D			**26.71**	**19.34**	**31.39**	**42.70**	**81.04**	**32.55**	**46.38**	**31.53**
SD |E|%D			**14.85**	**7.55**	**17.56**	**4.70**	**110.71**	**13.35**	**47.71**	**8.53**

Table 23- Comparison error for 2nd harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=1.15

No	Institute	Code	$C_{T2}\times10^3$		z_2/A		θ_2/Ak		Ave.	
			Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	2.697	1.8294	0.0128	0.2139	0.0139	0.2010		
1	FORCE	StarCCM+			-35.61	8.50	24.95	14.84	30.28	11.67
2	HSVA	FreSCo+			-2.92	2.02	7.06	2.14	4.99	2.08
3	IIHR	CFDShip-Iowa	-29.87	11.42	20.50	2.62	9.36	5.76	19.91	6.60
4	KRISO	WAVIS			14.09	7.50	-6.35	12.96	10.22	10.23
5	MARIC	FINEMarine31_3			-64.31		-22.74		43.53	
6	NMRI	NAGISA			-112.04	-3.27	-24.90	-16.38	68.47	9.83
7	NUMECA	ISISCFD	17.57	1.06	-2.42	1.72	5.14	1.11	8.38	1.30
8	UDE	OpenFOAM								
9	UM	OF23x			-0.57	2.06	12.67	3.35	6.62	2.71
10	UNIZAG	swenseFoam	25.29	-38.91	30.38	29.54	6.68	-34.96	20.78	34.47
Ave E%D			**4.33**	**-8.81**	**-16.99**	**6.34**	**1.32**	**-1.40**	**7.55**	**5.52**
SD E%D			**24.39**	**21.70**	**43.35**	**9.41**	**15.47**	**15.46**	**27.74**	**15.53**
Ave |E|%D			**24.24**	**17.13**	**31.43**	**7.15**	**13.32**	**11.44**	**23.00**	**11.91**
SD |E|%D			**5.08**	**15.97**	**34.36**	**8.81**	**7.98**	**10.50**	**15.80**	**11.76**

Table 24- Comparison error for 2nd harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=1.37

No	Institute	Code	$C_{T2}\times10^3$		z_2/A		θ_2/Ak		Ave.	
			Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	2.201	2.9030	0.0068	0.5799	0.0118	0.7084		
1	FORCE	StarCCM+	5.45	103.35	-21.93	4.38	1.18	3.11	9.52	36.95
2	HSVA	FreSCo+	18.04	-0.73	12.52	-140.92	13.48	0.75	14.68	47.47
3	IIHR	CFDShip-Iowa	-67.69	3.39	-34.67	-145.53	-2.43	2.08	34.93	50.33
4	KRISO	WAVIS	35.71	-8.61	22.84	-424.82	-63.40	-6.66	40.65	146.7
5	MARIC	FINEMarine31_3	-29.32		-12926		-220.87		4392.22	
6	NMRI	NAGISA	67.16	-1.69	10.72	-446.37	53.56	-6.45	43.81	151.50
7	NUMECA	ISISCFD	2.98	-3.33	-3.23	-109.99	-11.32	0.04	5.85	37.79
8	UDE	OpenFOAM								
9	UM	OF23x	8.37	-0.68	-4.90	37.03	-14.92	7.67	9.40	15.13
10	UNIZAG	swenseFoam	11.37	-35.96	-41.32	435.04	-9.79	10.35	20.83	160.4
Ave E%D			**5.79**	**6.97**	**-1443**	**-98.90**	**-28.28**	**1.36**	**492.33**	**35.74**
SD E%D			**35.73**	**38.22**	**4060.10**	**261.07**	**73.87**	**5.61**	**1389.90**	**101.6**
Ave |E|%D			**27.34**	**19.72**	**1453.18**	**218.01**	**43.44**	**4.64**	**507.99**	**80.79**
SD |E|%D			**23.71**	**33.48**	**4056.44**	**174.38**	**66.10**	**3.43**	**1382.09**	**70.43**

Table 25- Comparison error for 2nd harmonic of resistance and motions for KCS seakeeping submissions at Fr=0.26 and λ/L=1.95

No	Institute	Code	$C_{T2}\times10^3$		z_2/A		θ_2/Ak		Ave.	
			Amp	ε [rad]	Amp	ε [rad]	Amp	ε [rad]	Amp	Phase
	FORCE	*Experiment*	0.675	-0.4461	0.0204	0.7941	0.0372	1.6463		
1	FORCE	StarCCM+	38.32	7.28	16.29	-7.70	12.29	-6.88	22.30	7.29
2	HSVA	FreSCo+	1.68	-6.39	10.91	-11.29	-3.91	-10.66	5.50	9.45
3	IIHR	CFDShip-Iowa	-159.26	21.99	8.60	-9.16	-8.61	-8.89	58.82	13.35
4	KRISO	WAVIS	0.75	33.85	-1.07	-1.43	54.28	16.46	18.70	17.25
5	MARIC	FINEMarine31_3	-64.05		-2.72		-4.95		23.91	
6	NMRI	NAGISA	-41.40	11.58	31.52	1.03	-30.78	10.34	34.57	7.65
7	NUMECA	ISISCFD	8.29	-5.59	7.20	-11.13	1.39	-10.44	5.63	9.05
8	UDE	OpenFOAM	-133.05	-3.52					133.05	3.52
9	UM	OF23x	0.42	-0.95	8.83	-5.95	1.99	-6.79	3.75	4.56
10	UNIZAG	swenseFoam	27.84	-26.47	3.64	100.14	2.13	-36.40	11.20	54.34
Ave E%D			**-32.05**	**3.53**	**9.24**	**6.81**	**2.65**	**-6.66**	**14.65**	**5.67**
SD E%D			**63.97**	**16.64**	**9.63**	**35.51**	**21.36**	**14.76**	**31.65**	**22.30**
Ave |E|%D			**47.51**	**13.07**	**10.09**	**18.48**	**13.37**	**13.36**	**23.65**	**14.97**
SD |E|%D			**53.51**	**10.88**	**8.74**	**31.08**	**16.87**	**9.16**	**26.37**	**17.04**

Table 26- Average comparison error $E\%D$ for 2nd harmonic of resistance and motions over five wavelength conditions (λ/L=0.65, 0.85, 1.15, 1.37, 1.95) for KCS seakeeping submissions at Fr=0.26

No	Institute	Code	C_T		Heave		Pitch		Ave.	
			Amp	Phase**	Amp	Phase	Amp	Phase	Amp	Phase
1	FORCE	StarCCM+	37.31	39.33	12.52	-8.09	17.74	-3.97	22.52	17.13
2	HSVA	FreSCo+	32.67	6.15	30.24	-48.88	8.02	-16.33	23.64	23.79
3	IIHR	CFDShip-Iowa	-39.26	5.58	12.82	-45.31	-13.64	-12.51	21.91	21.13
4	KRISO	WAVIS	33.97	4.11	31.15	-99.80	6.13	-8.86	23.75	37.59
5	MARIC	FINEMarine31_3	6.05		-2609.51		-184.0		933.20	
6	NMRI	NAGISA	10.92	0.63	-20.69	-104.27	-22.38	-14.27	18.00	39.72
7	NUMECA	ISISCFD	24.66	-4.53	-4.67	-41.00	-48.10	-15.34	25.81	20.29
8	UDE	OpenFOAM	-34.49	-10.21					34.49	10.21
9	UM	OF23x	28.57	2.80	26.54	-11.35	3.02	-11.20	19.38	8.45
10	UNIZAG	swenseFoam	28.98	-8.56	23.91	125.87	6.85	-12.42	19.91	48.95
Ave E%D			**12.94**	**3.92**	**-277.52**	**-29.10**	**-25.16**	**-11.86**	**105.21**	**14.96**
SD E%D			**26.63**	**13.75**	**824.64**	**67.28**	**59.30**	**3.71**	**303.52**	**28.25**
G2010 Ave E%D (6 submissions*)			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
G2010 SD E%D (6 submissions*)			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Table 27- Average comparison error $|E|\%D$ for 2nd harmonic of resistance and motions over five wavelength conditions (λ/L=0.65, 0.85, 1.15, 1.37, 1.95) for KCS seakeeping submissions at Fr=0.26

No	Institute	Code	C_T		Heave		Pitch		Ave.	
			Amp	Phase**	Amp	Phase	Amp	Phase	Amp	Phase
1	FORCE	StarCCM+	37.31	39.33	41.29	14.54	17.74	12.95	32.11	22.27
2	HSVA	FreSCo+	32.67	9.71	31.40	49.69	12.16	17.49	25.41	25.63
3	IIHR	CFDShip-Iowa	63.47	12.34	29.29	46.35	26.32	15.64	39.69	24.78
4	KRISO	WAVIS	33.97	16.74	31.58	102.80	34.03	20.63	33.19	46.72
5	MARIC	FINEMarine31_3	52.73		2610.94		184.03		949.23	
6	NMRI	NAGISA	35.84	10.04	41.22	104.68	47.05	18.40	41.37	44.38
7	NUMECA	ISISCFD	24.66	7.53	13.22	41.69	50.71	15.80	29.53	21.67
8	UDE	OpenFOAM	54.21	11.43					54.21	11.43
9	UM	OF23x	28.57	3.62	28.73	26.98	8.99	15.61	22.10	15.40
10	UNIZAG	swenseFoam	28.98	31.98	40.44	125.87	11.53	17.26	26.98	58.37
Ave |E|%D			39.24	15.86	318.68	64.08	43.62	16.72	133.85	32.22
SD |E|%D			12.29	11.23	810.48	38.44	51.70	2.14	291.49	17.27
G2010 Ave |E|%D (6 submissions*)			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
G2010 SD |E|%D (6 submissions*)			**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

* Averaged over KCS seakeeping cases reported in Chapter 4 with (λ/L, Fr) of (1.1, 0.26), (1.33, 0.26), and (2.00, 0.33)

**Phase error is normalized by 2π ($E\%2\pi = 100 \times (D - S)/2\pi$)