

分航巷道內船舶密度探討 ~以麻六甲海峽航道第八航段為例

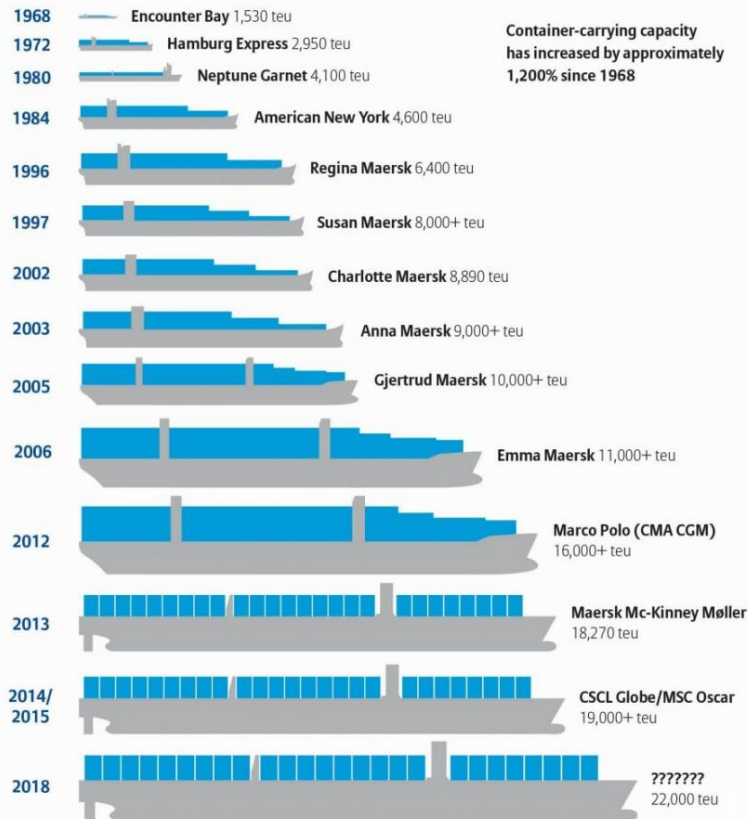


高 海 科 大
航海系許華智

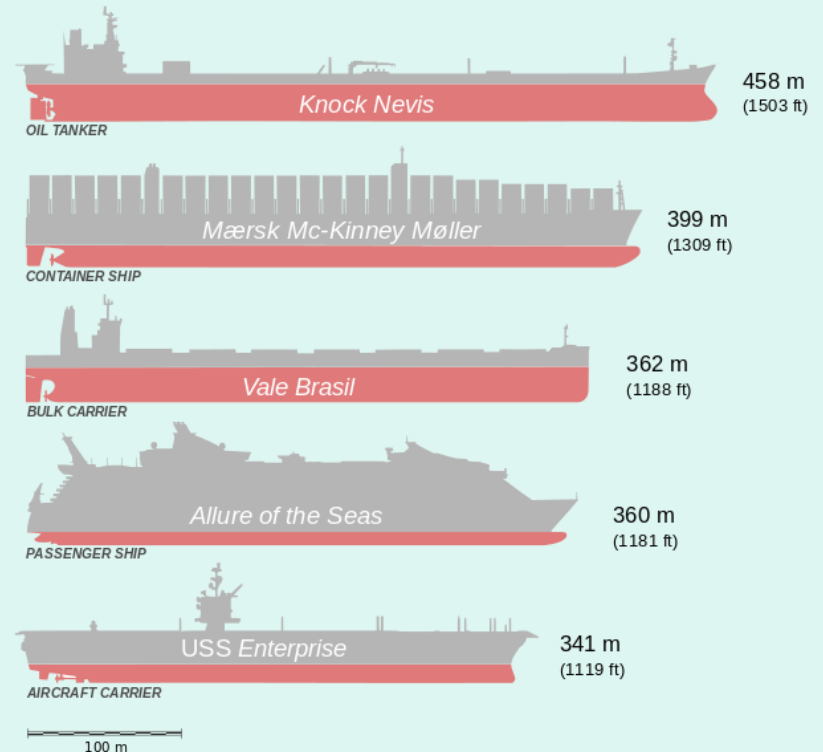


Gigantic size tendency

50 years of Container Ship Growth



Graphic: Allianz Global Corporate & Specialty.
Approximate ship capacity data: Container-transportation.com



山东大仁

- Gross Tonnage: **198980**
- Deadweight: **402285 t**
- Length × Breadth: **362m × 65.06m**
- Year Built: **2012**



New York Express

- Gross Tonnage:
142295
- Deadweight:
142028 t
- Length × Breadth:
366.52m × 43m



綱要

領域

研究動機

議題

方法

調查結果

結論建議



船舶領域



船舶領域



~Obey the **RULE** in a
2D area movement
(Wu, 2004)

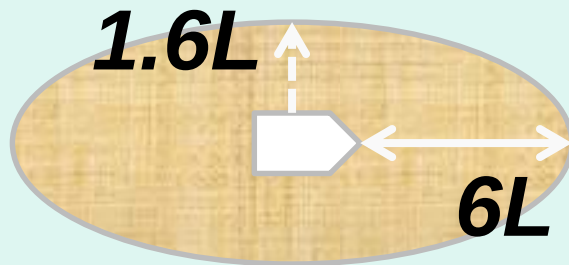
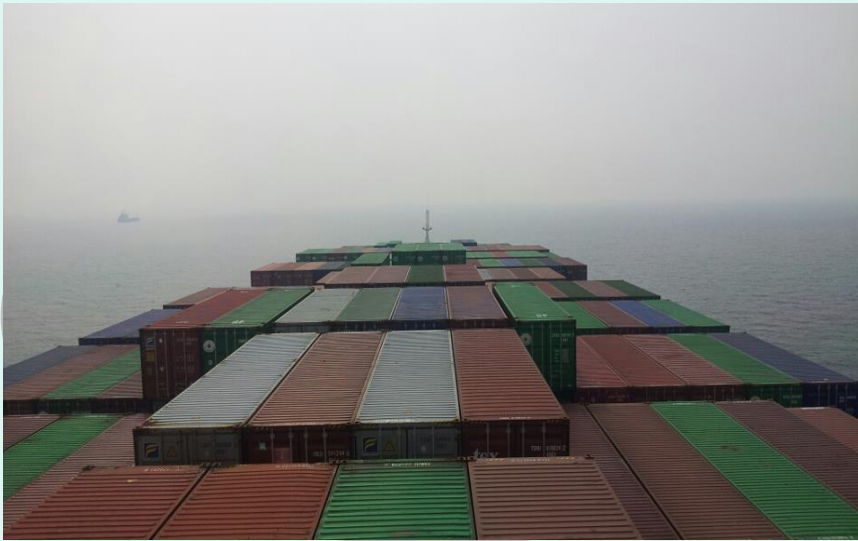


船舶領域*

□ 來自權利船的看法
(Fuji, 1981)

□ 開闊水域

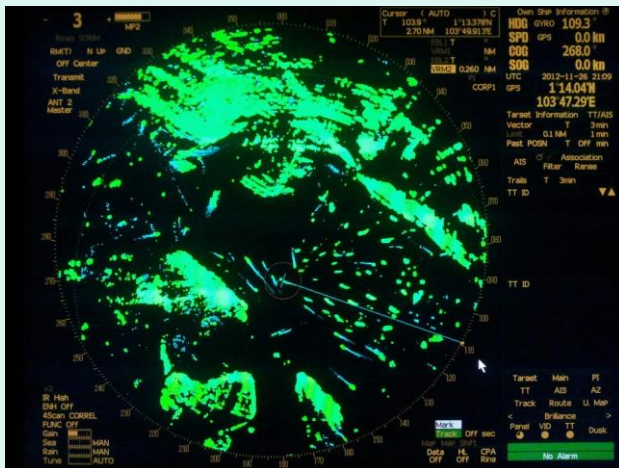
□ 限制水域



REF: Toyota, S. and Fujii, Y., Marine Traffic Engineering. The Journal of Navigation, 1971. 24(no 1): p. 24-34.



船舶領域



□ 本船觀點
(Goodwin, 1975)

□ 避讓他船TGs

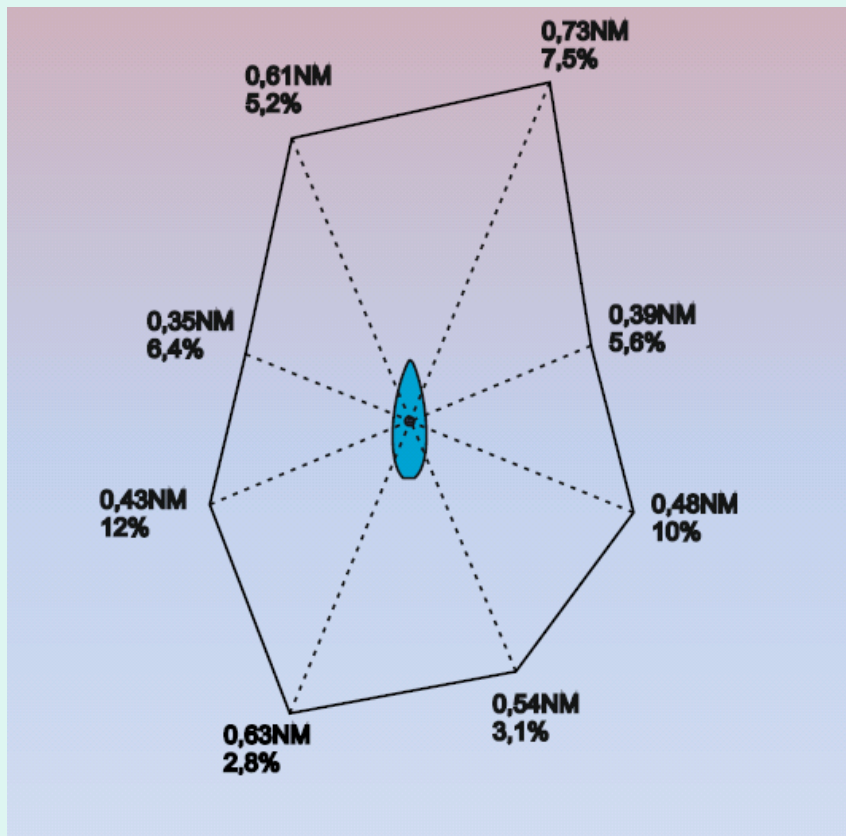
□ 航跡分佈



REF: Goodwin, E.M., A Statistical Study of Ship Domain. The Journal of Navigation, 1975. 28(no 3): p. 328-344.



船舶領域



□ 追越情勢

□ 中速油輪

□ 船長261公尺、船寬48公尺、速率11節

□ Domain:

2.04 海里 × 0.88海里





追越個案(1/2)

Before



Approaching



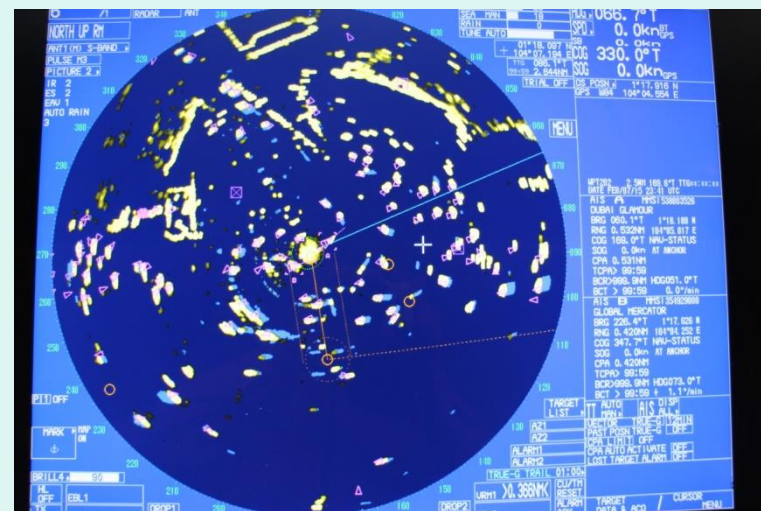
追越個案(2/2)

Abeam



Clear



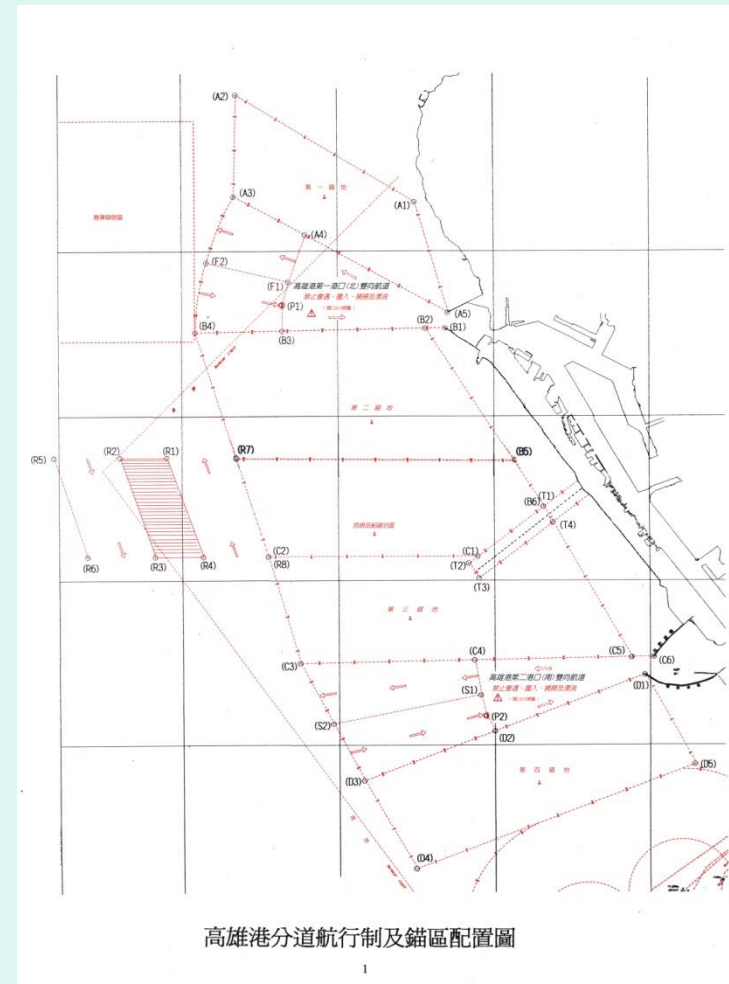
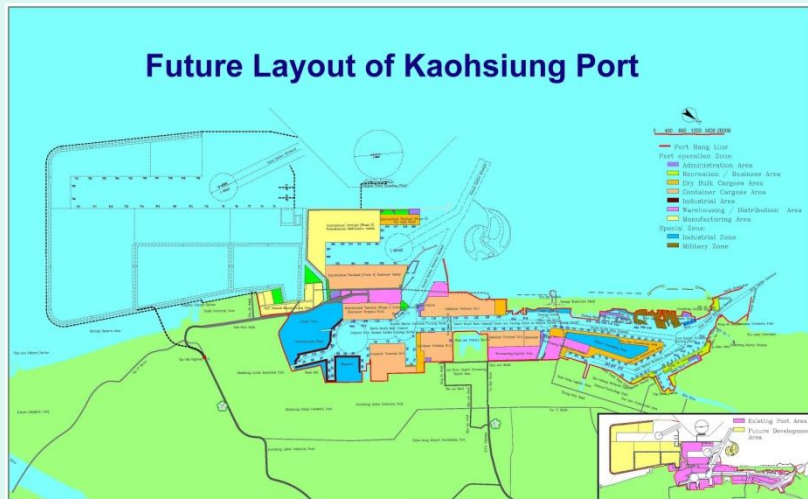


研究動機



高港第二港口

- 二港
- 團進團出
- 洲際二期擴建計畫

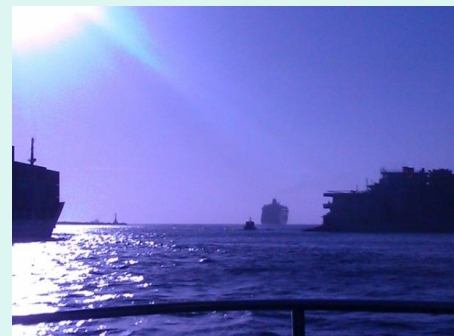


前後距離

- ~Distance between two queueing vessels :
- For ships under 500g.r.t. : ship's length $\times$ 4
 - 500 g.r.t. ~ 20,000 g.r.t. : 0.5 nm
 - over 20,000 g.r.t. : 1 nm



Queuing 情勢



研究議題



麻六甲海峽追越碰撞

- Beks Halil with
Thuan My
near Singapore

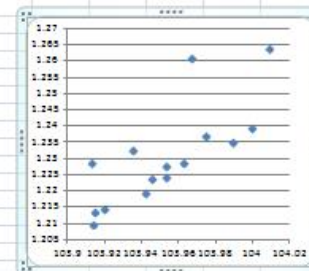


方法

~次級資料分析

圖表6

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	Town	船名	航向	航速	目的地	類型	長度	寬度	深度	吃水	高度	重量	速度	位置	經度	緯度	方位	距離(公尺)							
2	(西行)	1 WEST SCENE	258	6.4	JOHOR BAHRU	Cargo	146	24	104	0	29.71	1	15	50.44	104.0085	1.384017									
3		2 SHANDONG DA ZHI	261	5	SUEIC BAY	Cargo	382	66	103	57	58.31	1	15	40.25	103.9882	1.381284	86.26184	4882.041			0.164833	2.523333	1.380838	2.522721	15.30468
4		3 KIL SAMUT	250	8	KORSICHANG	Cargo	140	20	103	56	4.6	1	13	59.23	103.9346	1.333119	48.29099	4700.415			1.688687	1.895167	1.247192	1.894718	1.12202
5		4 ORIENT MATE	256	7.4	SINGAPORE	Cargo	181	30	103	54	46.73	1	13	44.4	103.913	1.229	79.21496	2446.243			0.247167	1.297833	1.23106	1.297534	5.249681
6																									
7																									
8	(東行)	1 NEW SPIRIT	80	11.8	QINGDAO CHINA	Tanker	330	60	103	59	56.96	1	14	22.71	103.9992	1.239643									
9		2 SARA FELICITA	81	11.9	SHANGHAI	Cargo	0	0	103	59	20.5	1	14	7.88	103.989	1.235522	87.88144	1214.689			0.247167	0.607667	1.237582	0.607525	2.457957
10		3 PACIFIC CONCORD	89	8.5	PORT HEDLAND	Cargo	395	46	103	58	26.73	1	14	14.67	103.9741	1.237408	82.80121	1673.498			0.113167	0.896167	1.238463	0.895958	7.917153
11		4 COSCOLD LAKE	80	11	QUANZHOU CHN	Tanker	330	60	103	57	45.33	1	13	44.4	103.9826	1.229	33.82092	1282.783			0.5045	0.89	1.233204	0.88984	1.367874
12		5 FAIR SEAS	68	12.9	MALTAQ	Cargo	250	44	103	57	8.87	1	13	40.69	103.9355	1.227969	84.18852	1130.953			0.061633	0.607667	1.238485	0.607527	9.825334
13		6 FORM ALICE	72	12.3	ZHUSHI	Cargo	183	32	103	57	8.87	1	13	29.57	103.9355	1.224881	0	343.3573			0.183333	0	1.228425	0	0
14		7 ANTONIS ANGELICOUN	70	3.6	US WEST COAST	Tanker	332	58	103	56	41.88	1	13	27.1	103.9449	1.224194	84.80819	842.5396			0.041167	0.458167	1.224538	0.458063	11.00858
15		8 KOTA HARIAN	76	14.9	EBGA SG	Cargo	157	25	103	56	30.55	1	13	10.42	103.9418	1.219561	33.70783	618.9078			0.378	0.1833	1.221878	0.185458	0.667114
16		9 HAKUYO MARU	71	9.2	EAST CPL	Cargo	71	10	103	55	9.6	1	12	53.12	103.9193	1.214756	77.93402	2354.529			0.288333	1.349167	1.217158	1.348884	4.678185
17		10 JOHANNES-S	68	13.7	NINGBO	Cargo	210	30	103	54	52.3	1	12	49.41	103.9145	1.213725	77.89356	546.017			0.061833	0.288333	1.21424	0.288269	4.662086
18		11 ANTRUNG 168	63	8.6	PW BOB	Cargo	79	12	103	54	48.59	1	12	36.44	103.9135	1.210122	15.92951	416.3899			0.216167	0.061833	1.211924	0.06182	0.285981

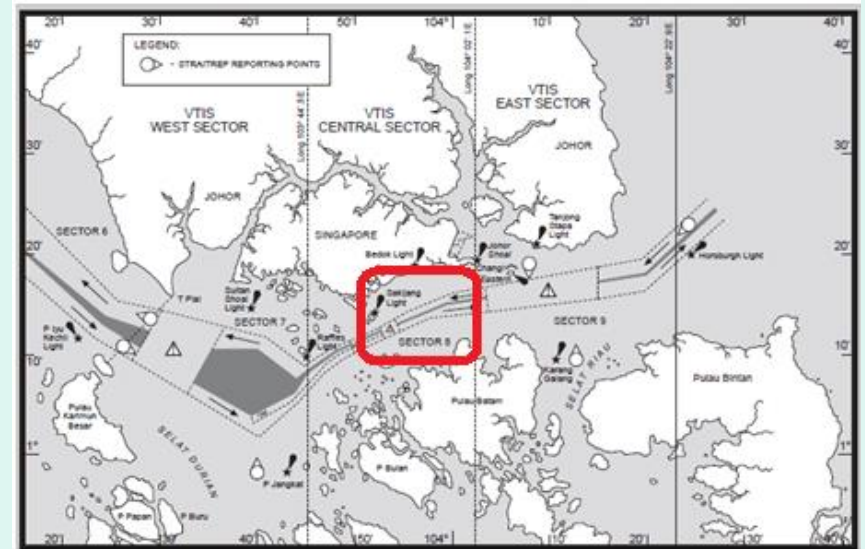
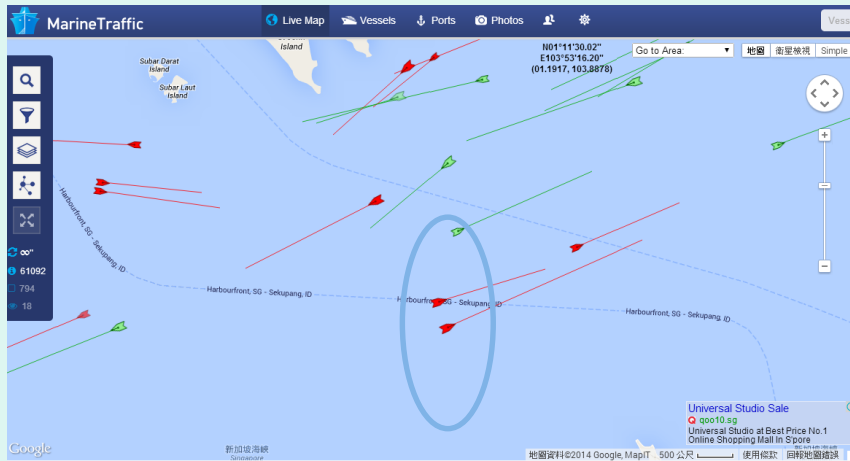


圖表區

麻六甲海峽

Marinetraffic.com

第八航段



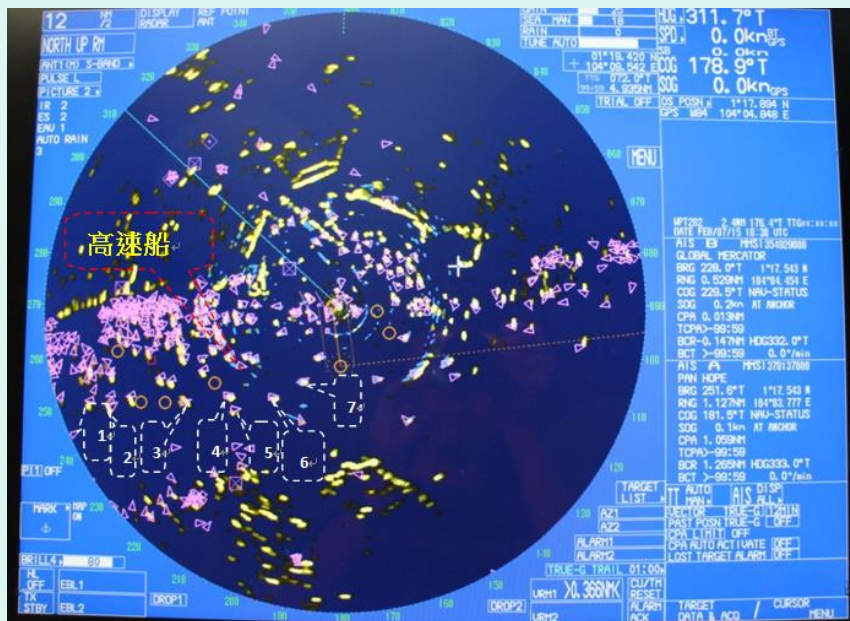
靜態船舶觀測

- 2015年2月7號當地時間1830，靜態船舶觀測點設於錨位：北緯度 $1^{\circ}17.894'$ ，東經度 $104^{\circ}04.848'$

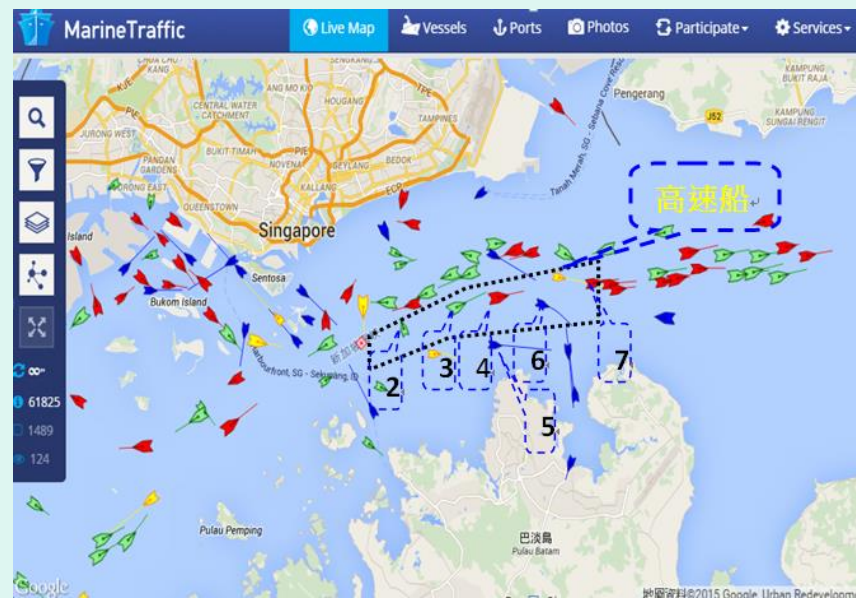


靜態船舶觀測

雷達與AIS交疊畫面



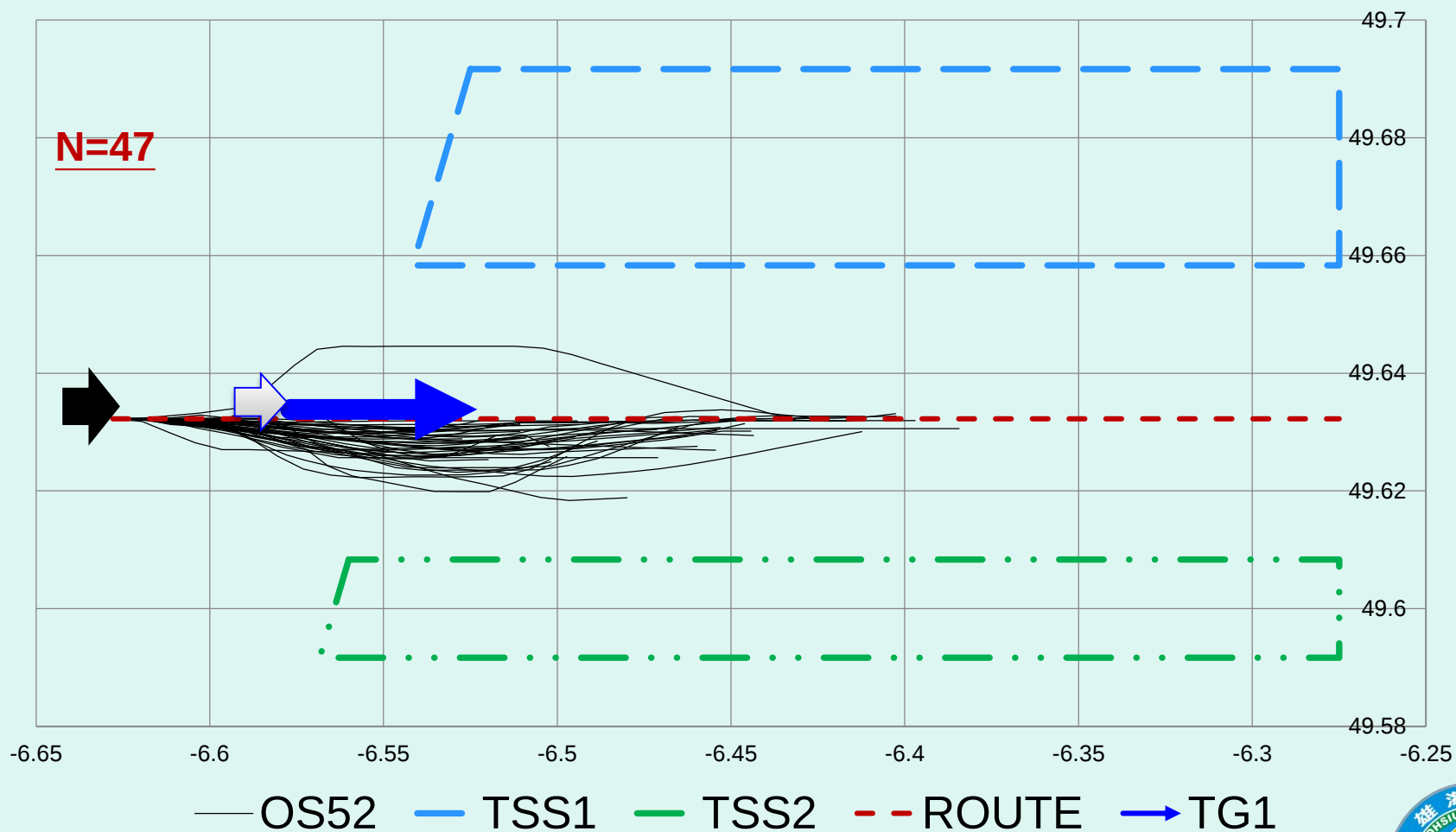
網站監控資料



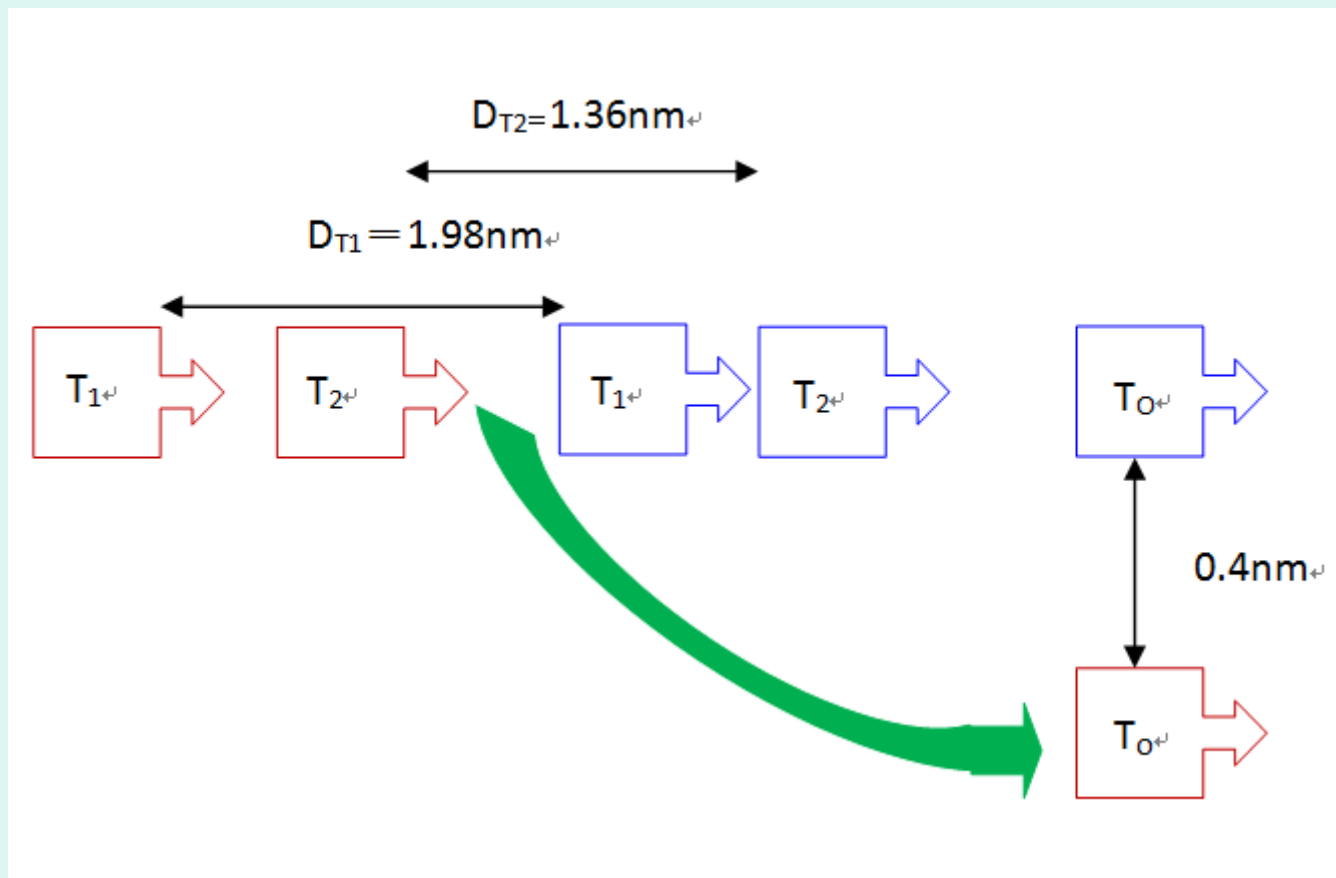
研究結果



追越航跡紀錄*

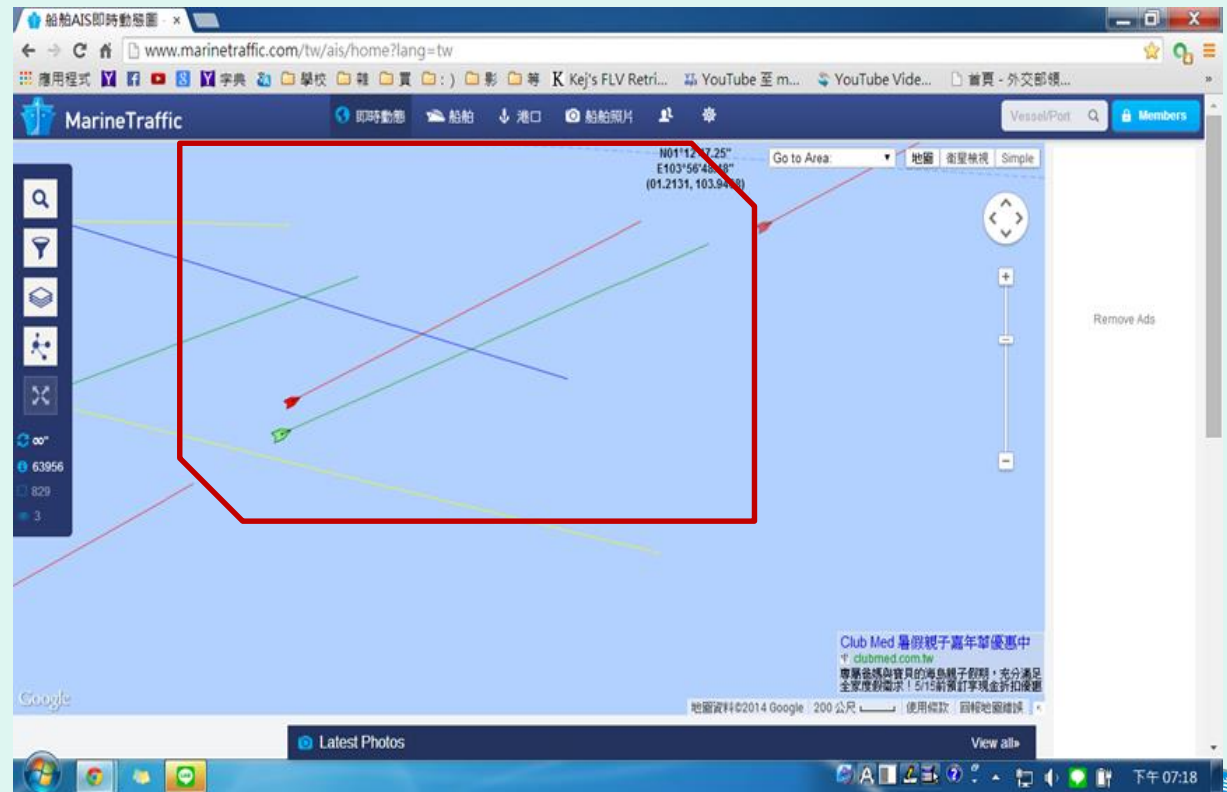


追越情勢



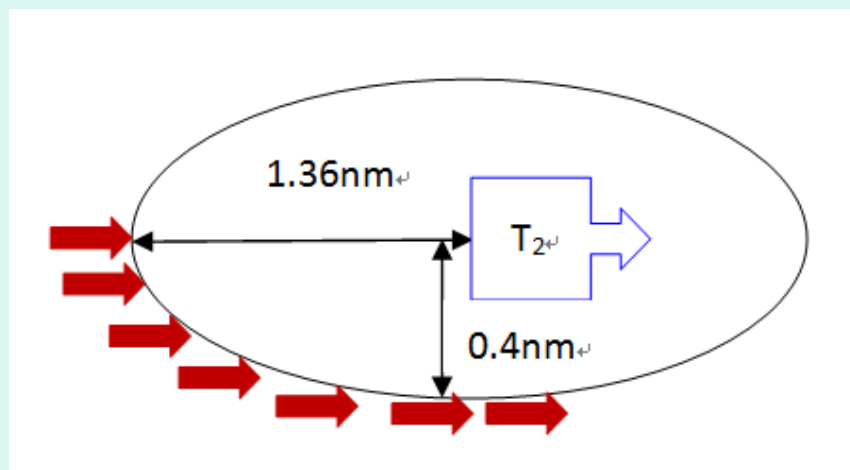
overtaking range*

Record Time	Distance (metres)
1350LT	79.01143255
1422LT	159.0130826
1440LT	283.5138753
1620LT	393.1356439
1626LT	317.0348438
1644LT	52.47333333
mean	214.0304
median	221.2635

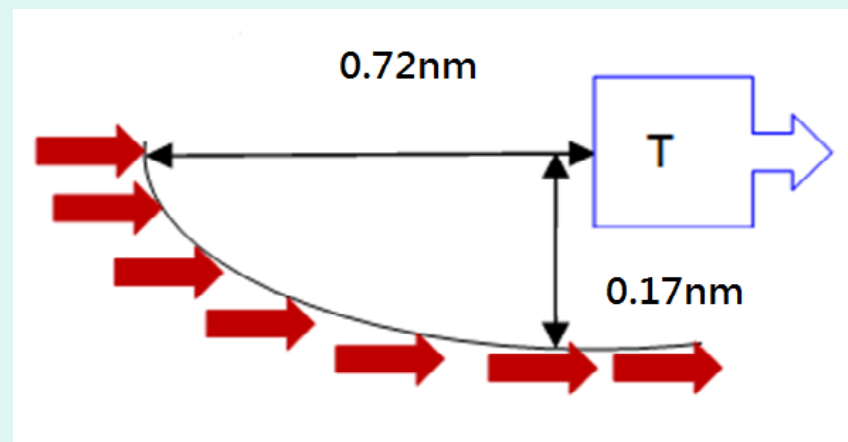


追越型船舶領域*

開闊水域模擬



分航巷道觀測



結論與建議

- Simulation results : ship domain of 1.4nm × 0.37nm
- Malacca Straits : 0.72nm × 0.17nm
- Philosophy: To obey the COLREGs
- Traffic/Efficiency/Safety
- An era of “Modern gadget”
- 本文作者特別在此感謝
台塑海運公司暨
台塑勇輝輪全體船員



The end

Thank you for listening
Questions?

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Dept. Shipping Technology

Feel free to contact me, email: hhsu@webmail.nkmu.edu.tw



操船模擬測試



參考文獻

1. https://www.youtube.com/watch?v=-_6ZF5XcMHg
2. https://www.youtube.com/watch?v=uv_opV6TTRU#t=19

