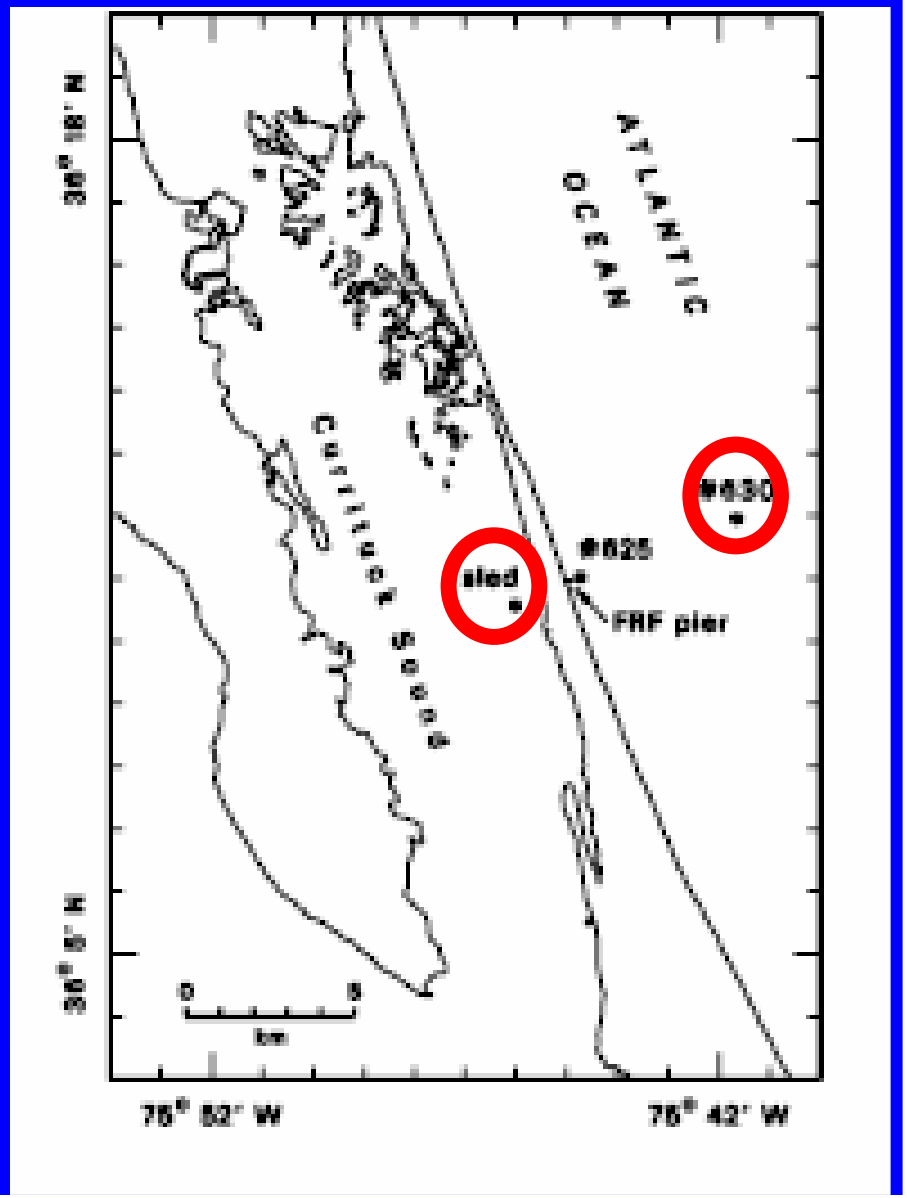

Two Scale Approximation for real spectra
Will Perrie and Don Resio

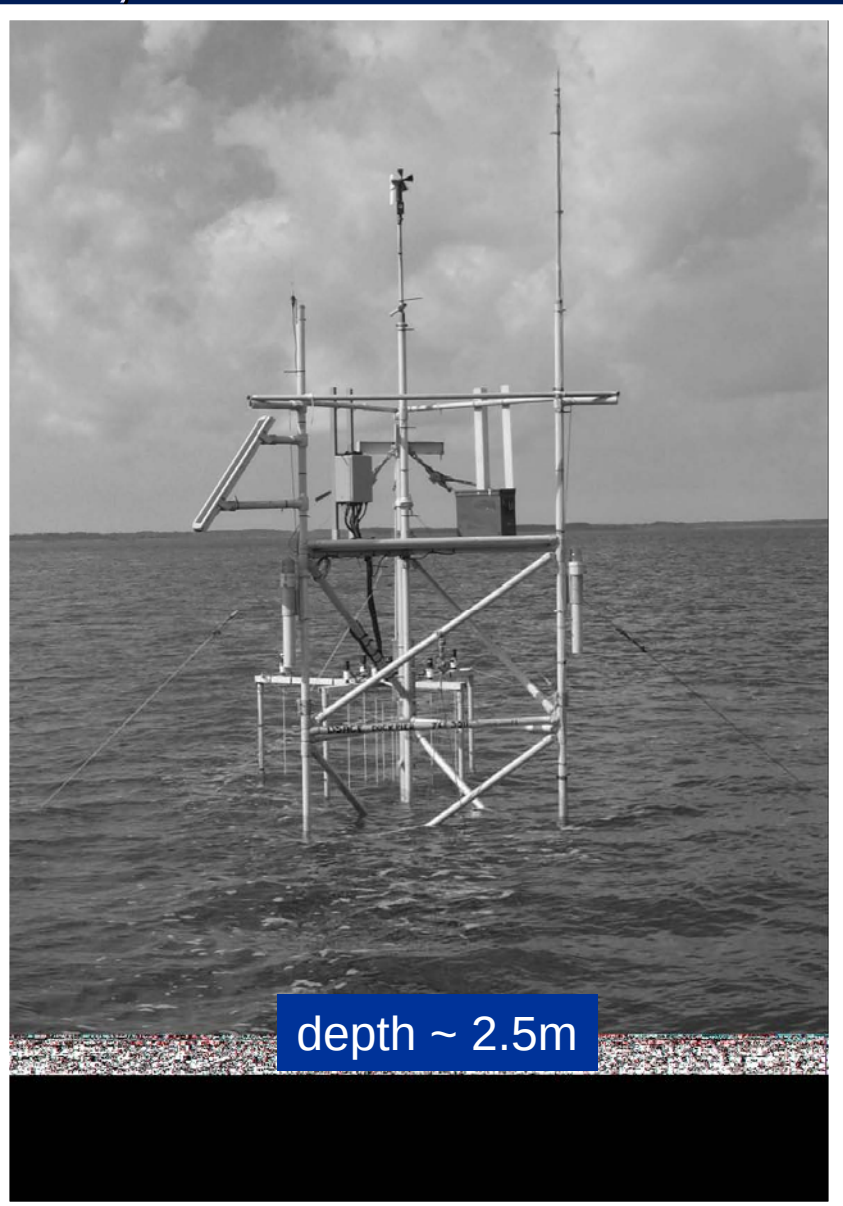
OUTLINE

- **Field data**
  - **Currituck Sound**
  - **FRF waverider**
- **Comparisons:**
  - **DIA, TSA, FB (Full Boltz or "exact")**
- **Error estimates**
- **Conclusions**

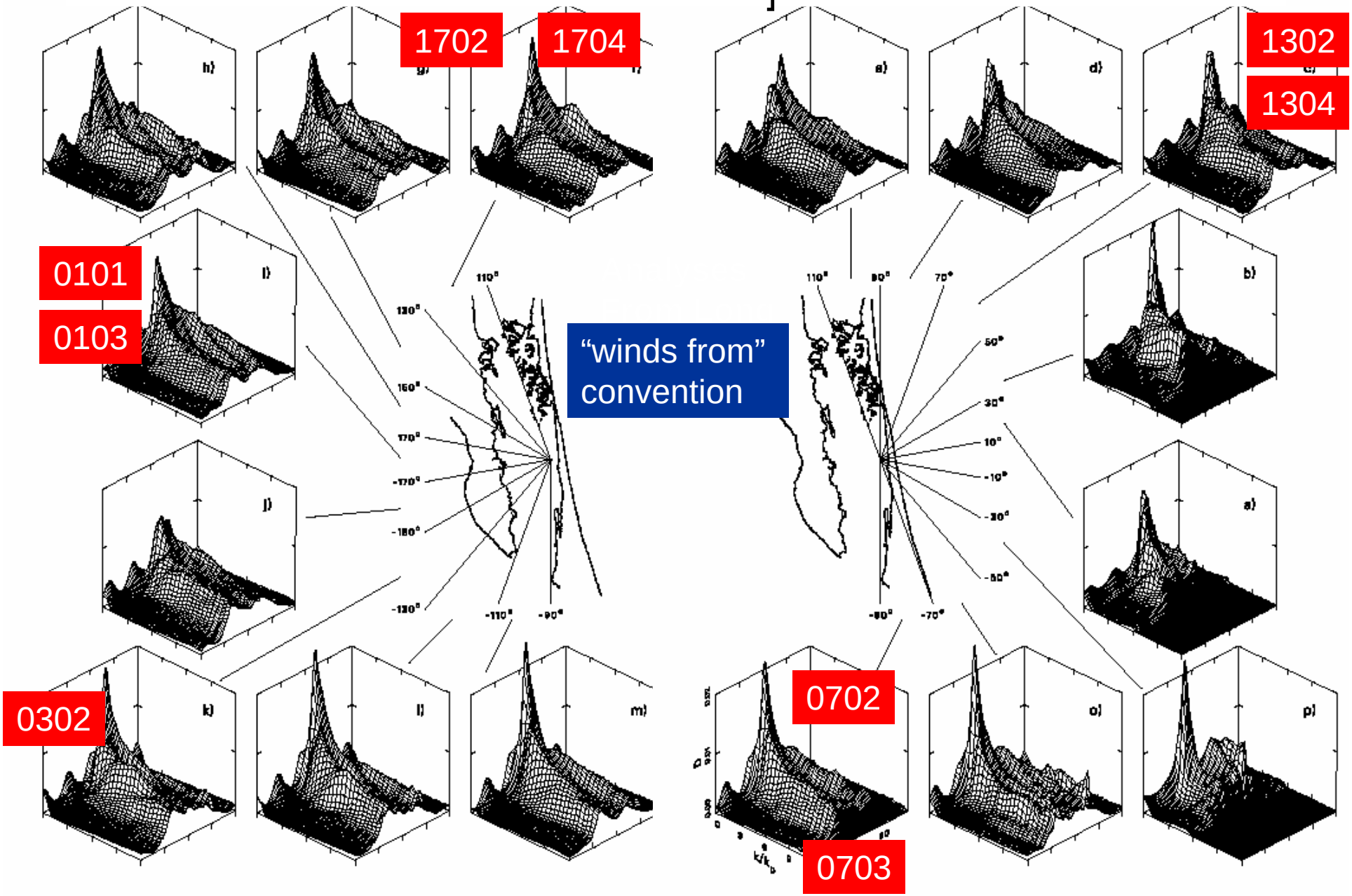
Currituck Sound data

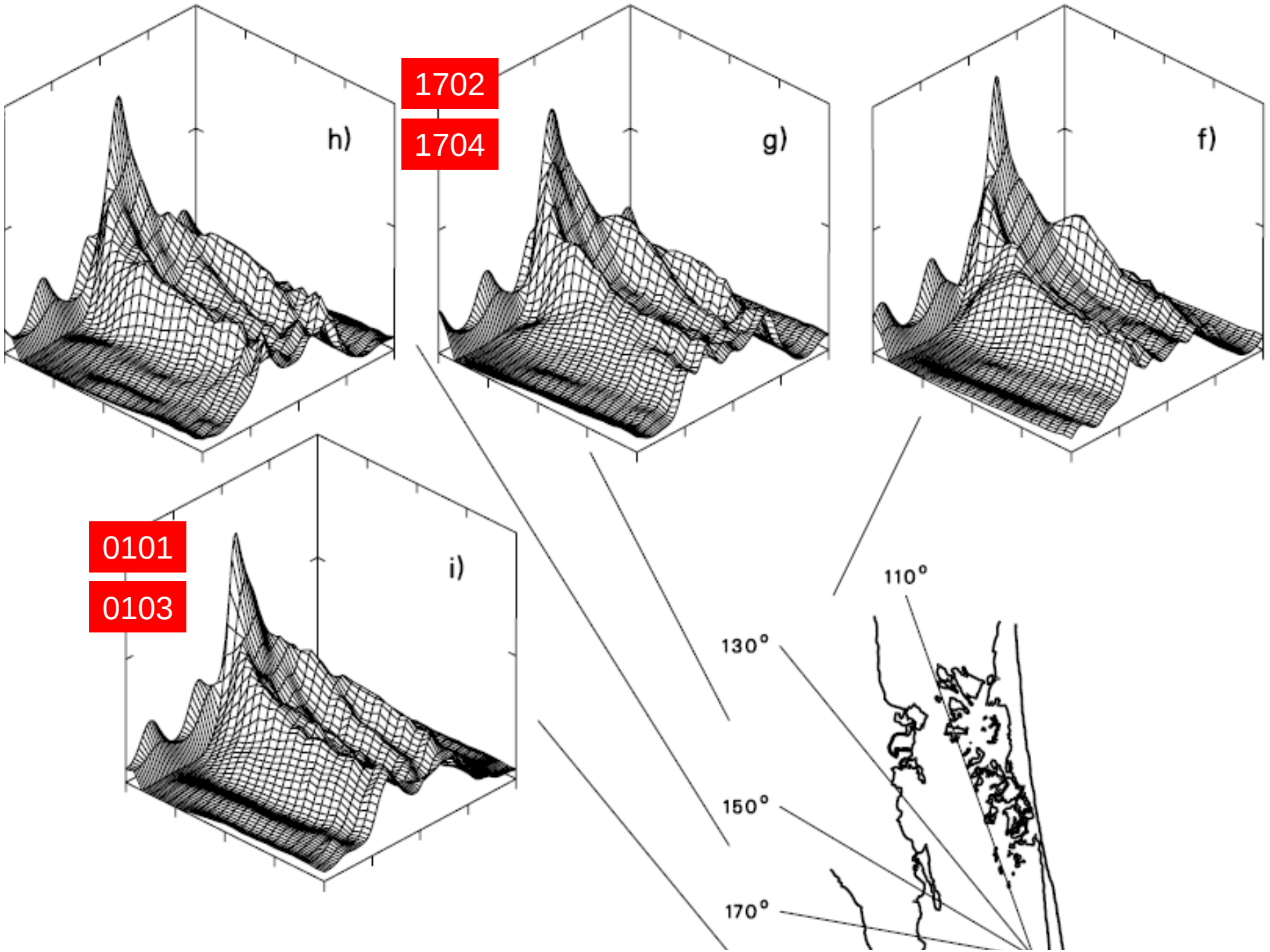
Long and Resio, 2006



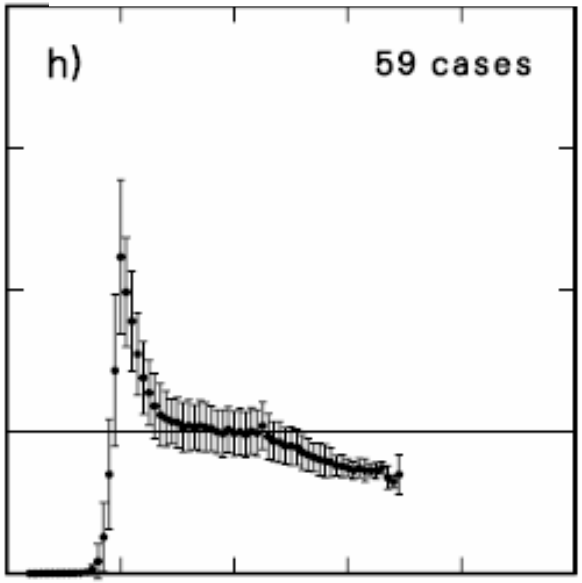


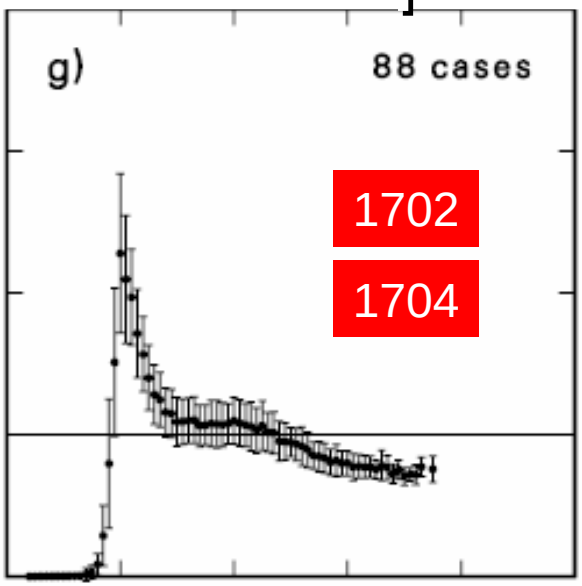
Currituck spectra

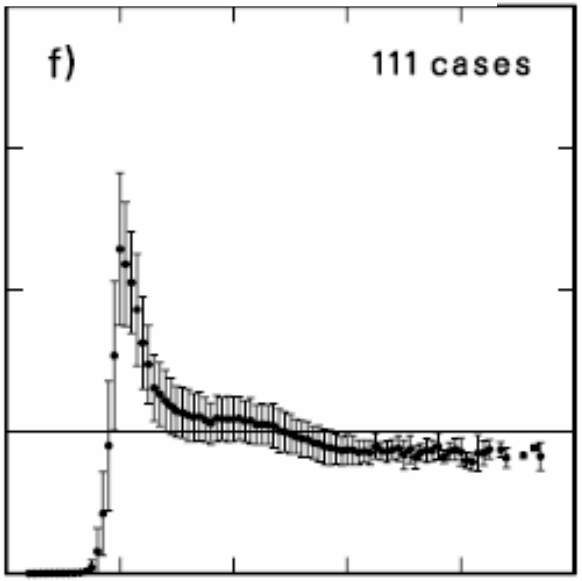


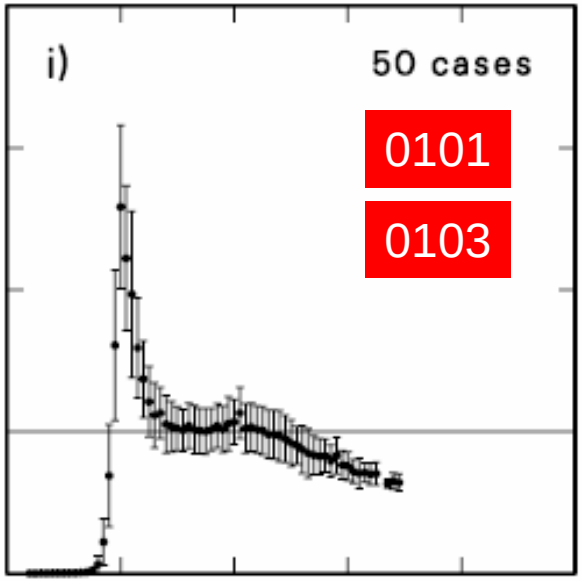

1702
1704
h)
g)
f)
0101
0103
i)
110°
130°
150°
170°

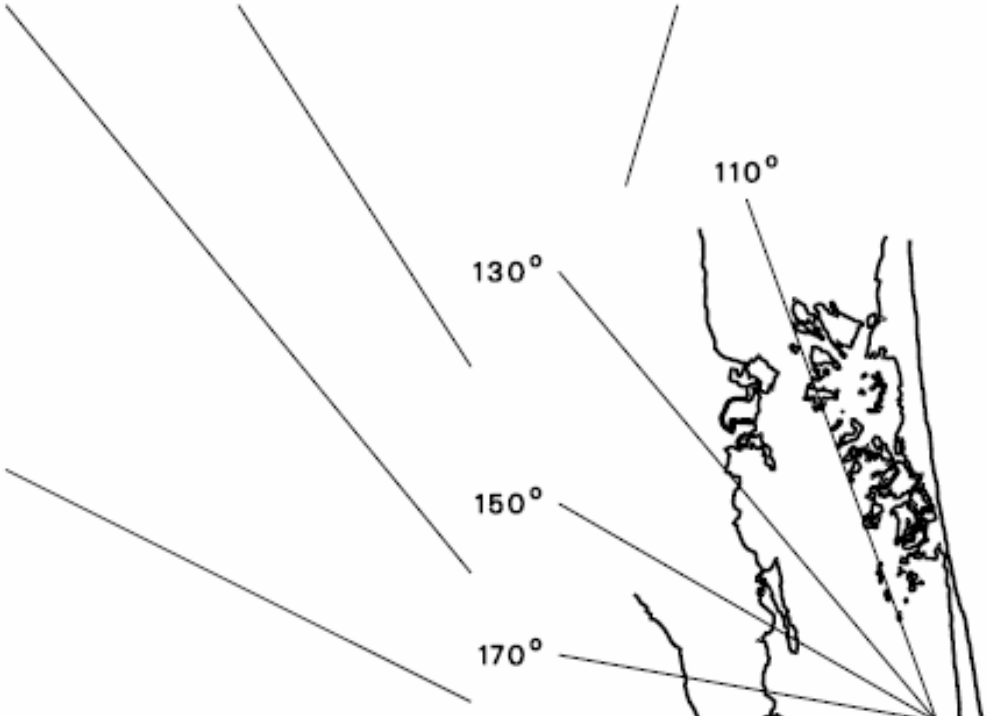
Currituck spectra





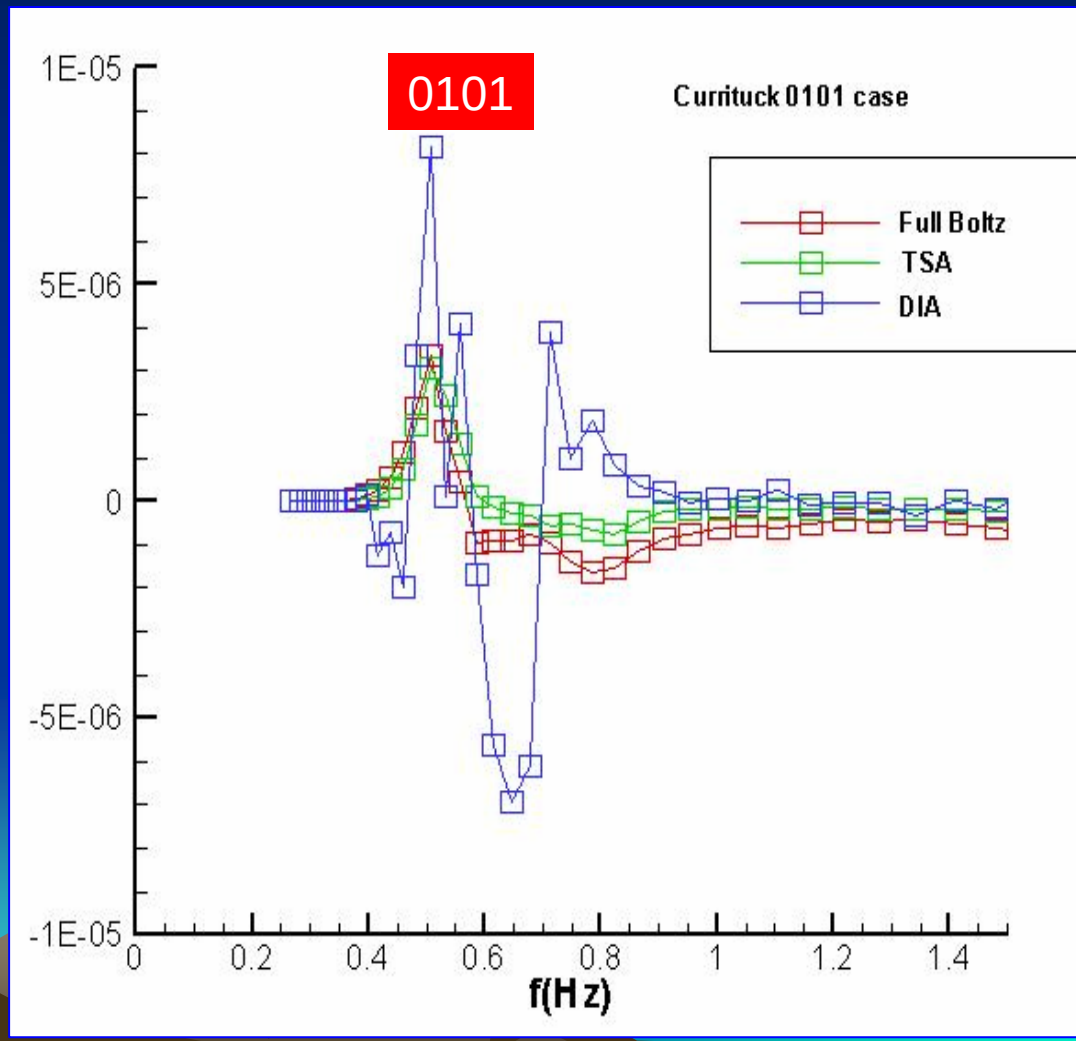






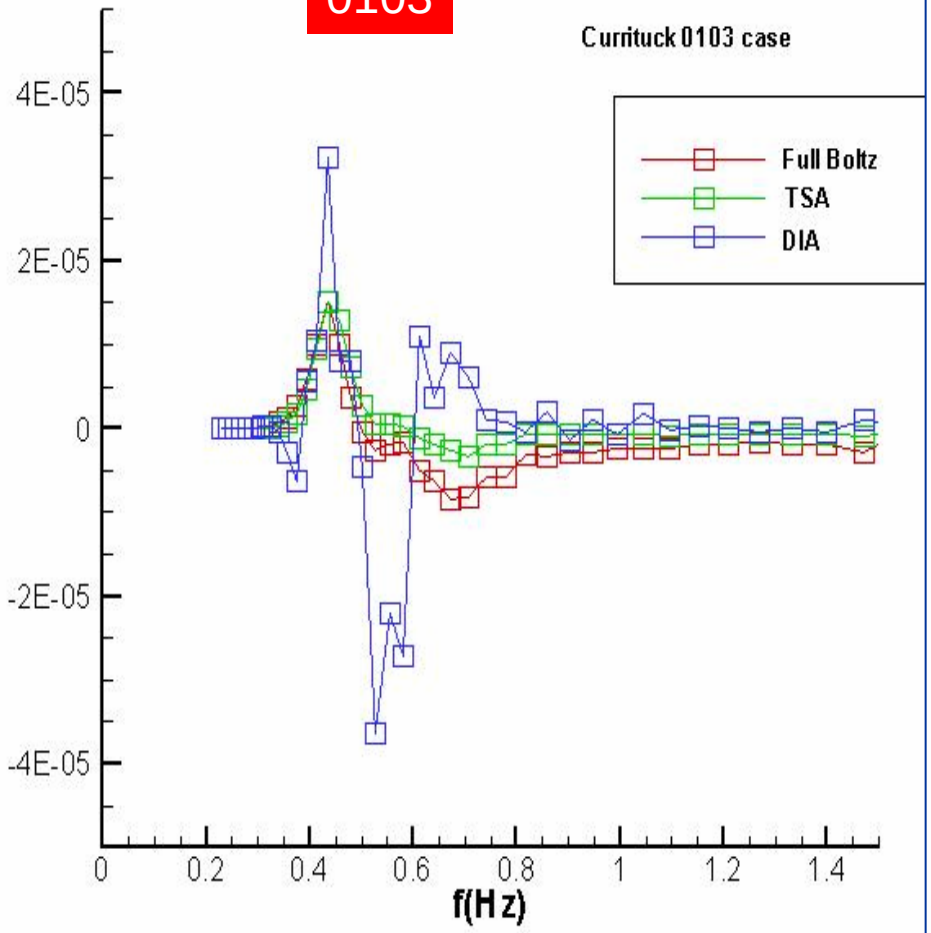
Currituck spectral cases

Case	Hs	Tp	u10/cp
0101	0.17	1.98	1.5-2.0
0103	0.27	2.30	2.5-3.0
0302	0.21	2.17	2.0-2.5
0702	0.12	1.90	2.0-2.5
0703	0.17	1.91	2.5-3.0
1302	0.11	1.69	2.0-2.5
1304	0.20	1.99	3.0-3.5
1702	0.18	1.96	2.0-2.5
1704	0.32	2.33	3.0-3.5

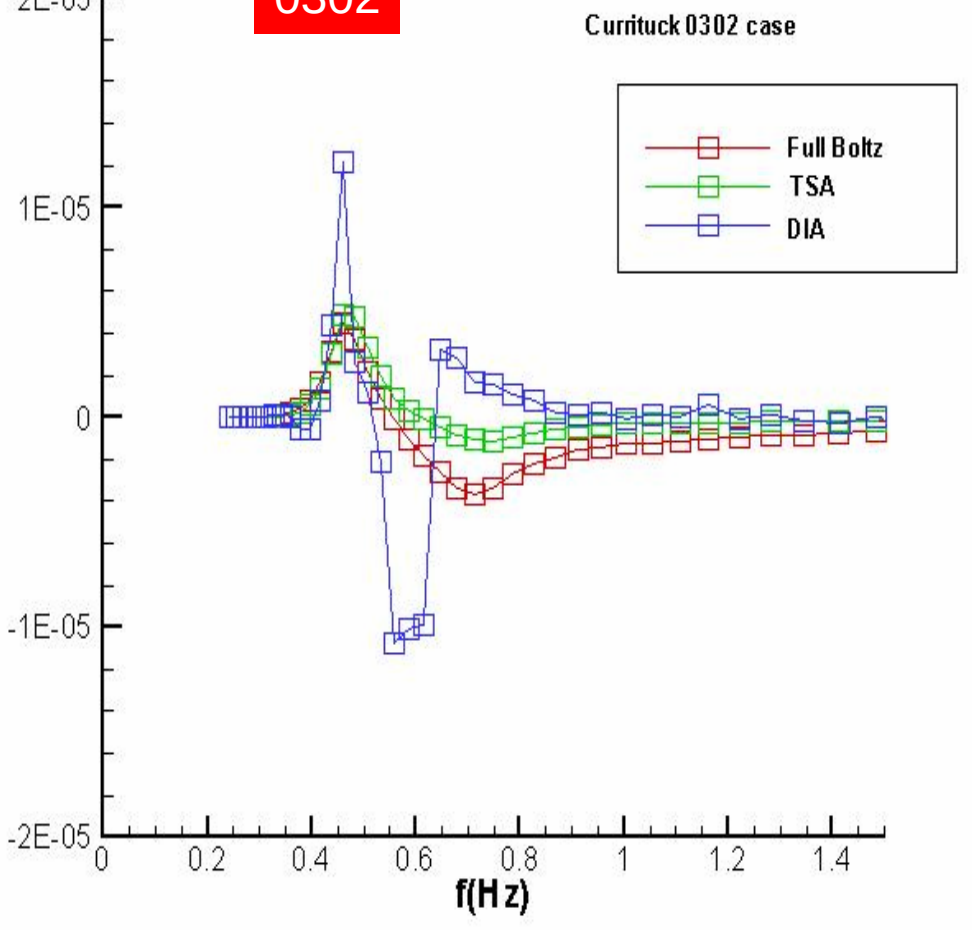


Currituck spectral cases

0103

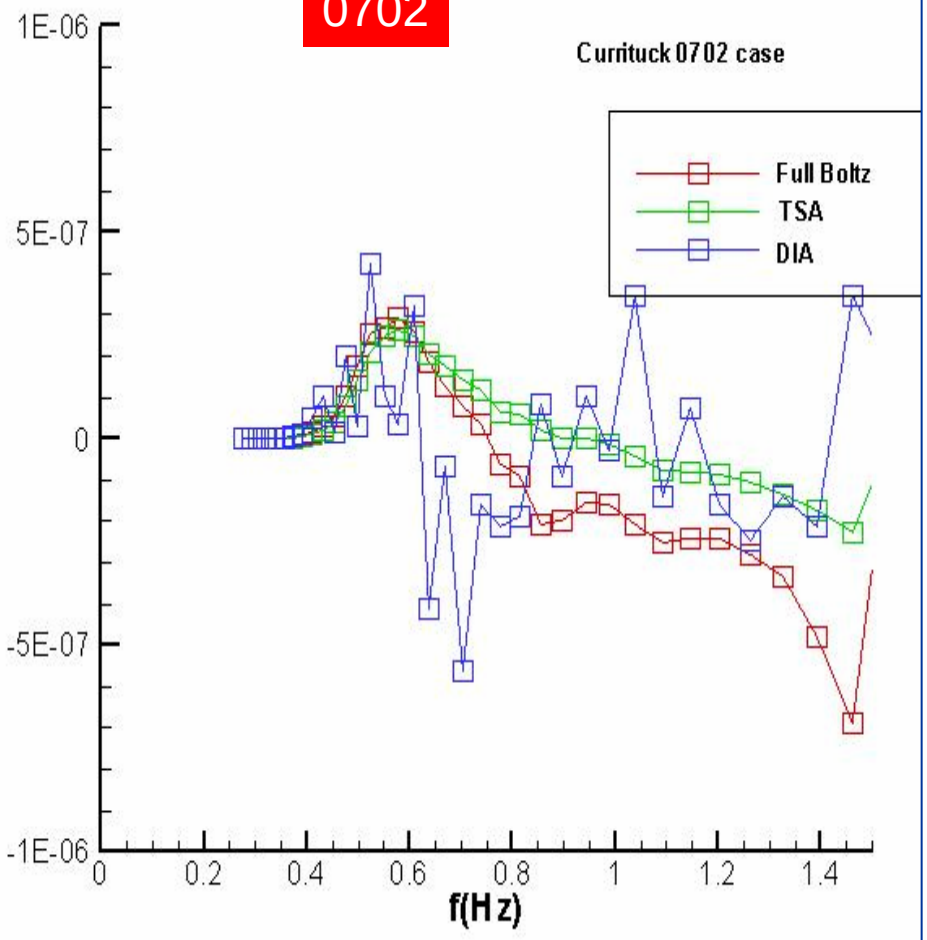


0302



Currituck spectral cases

0702



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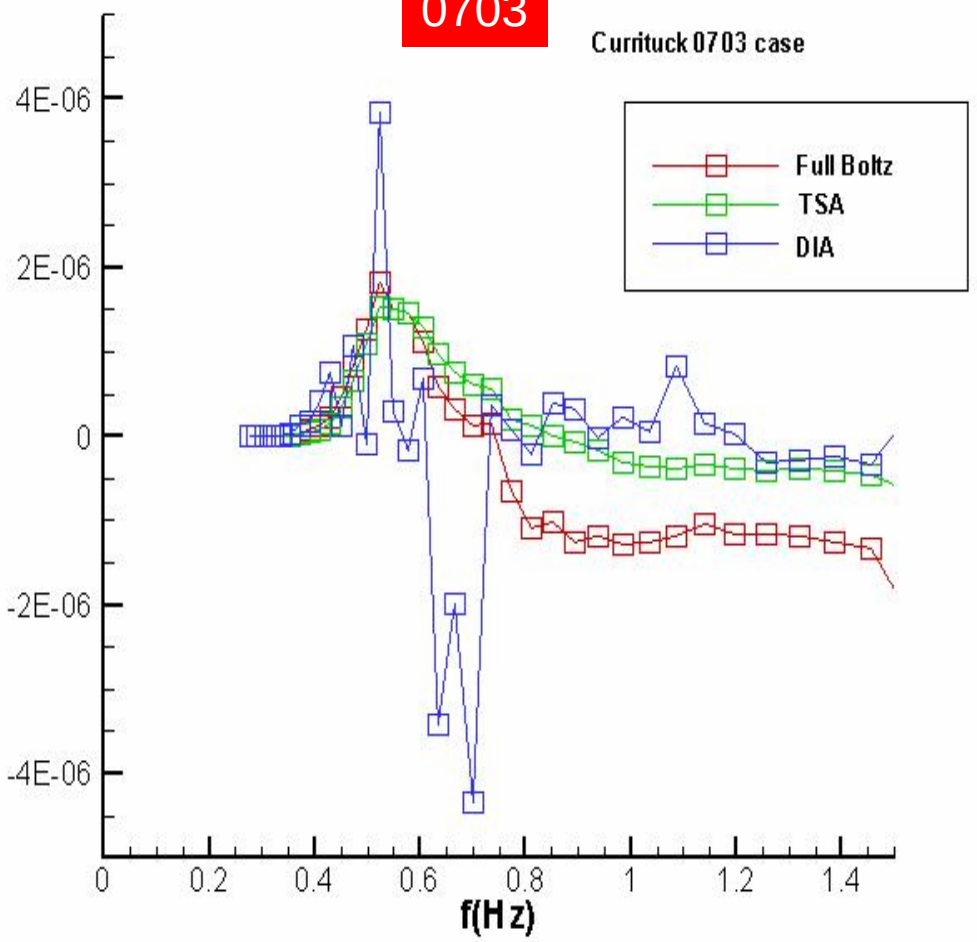
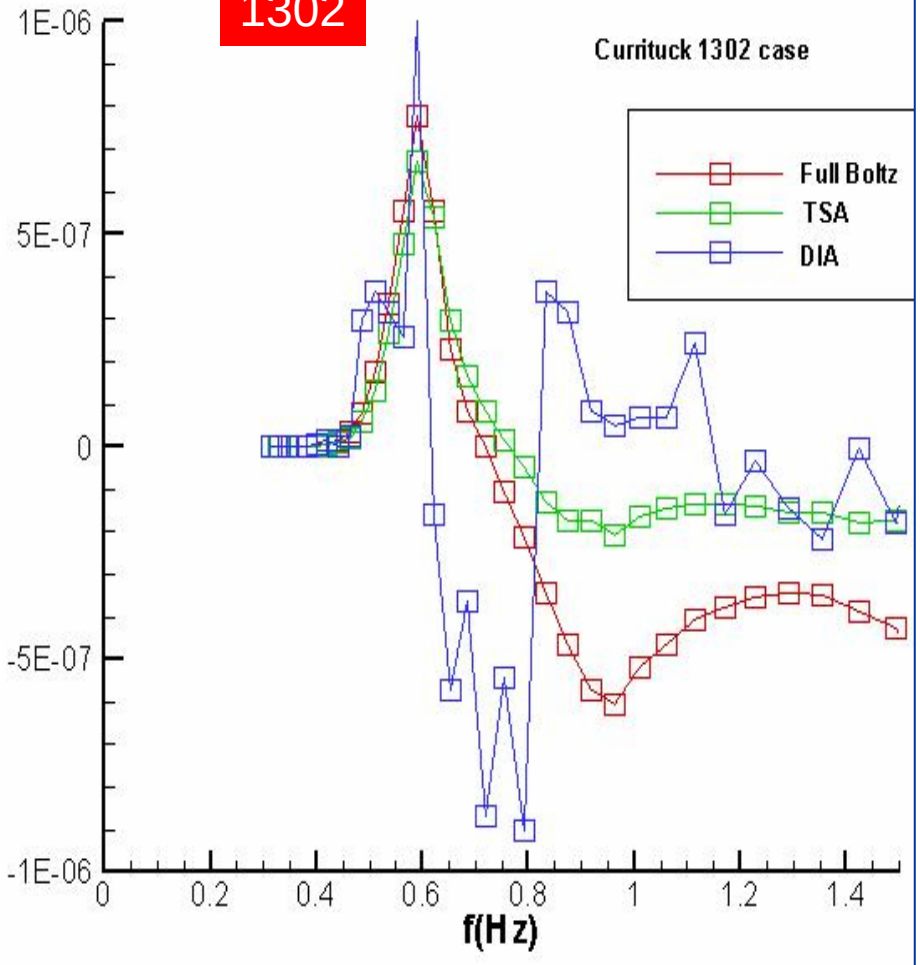
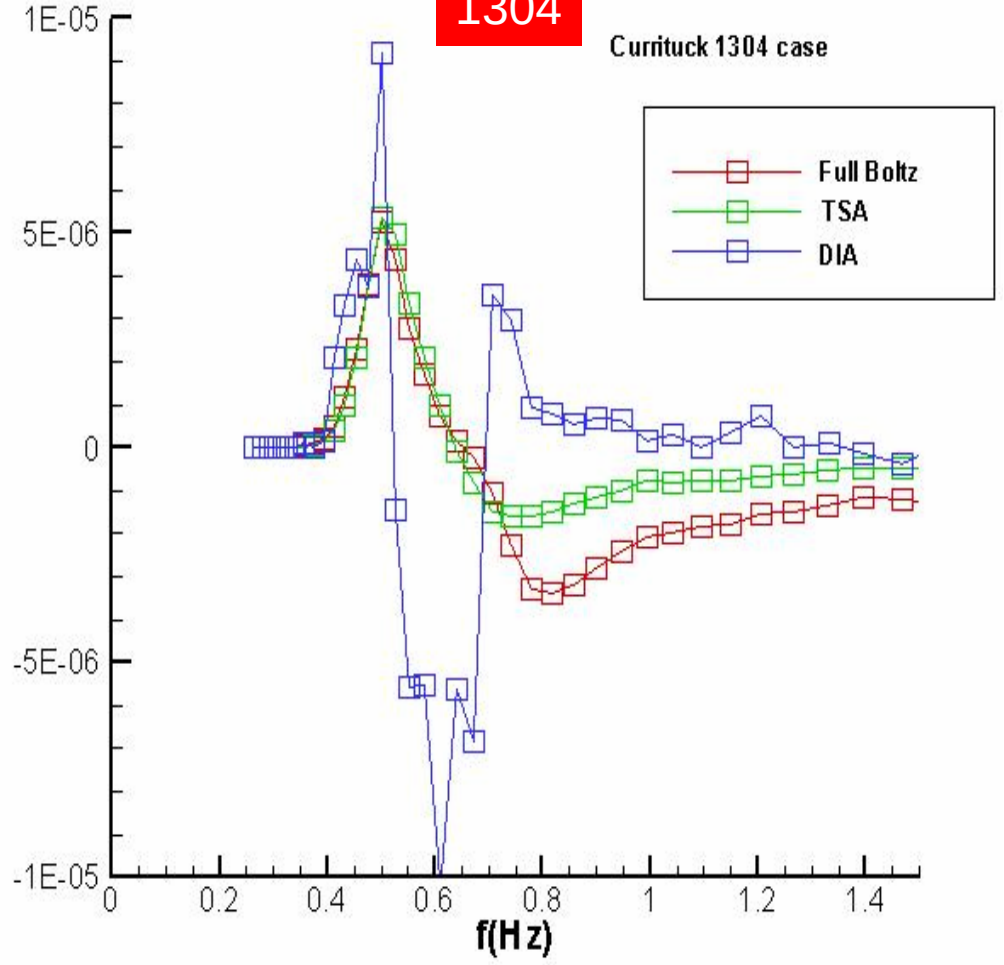


Currituck spectral cases

1302

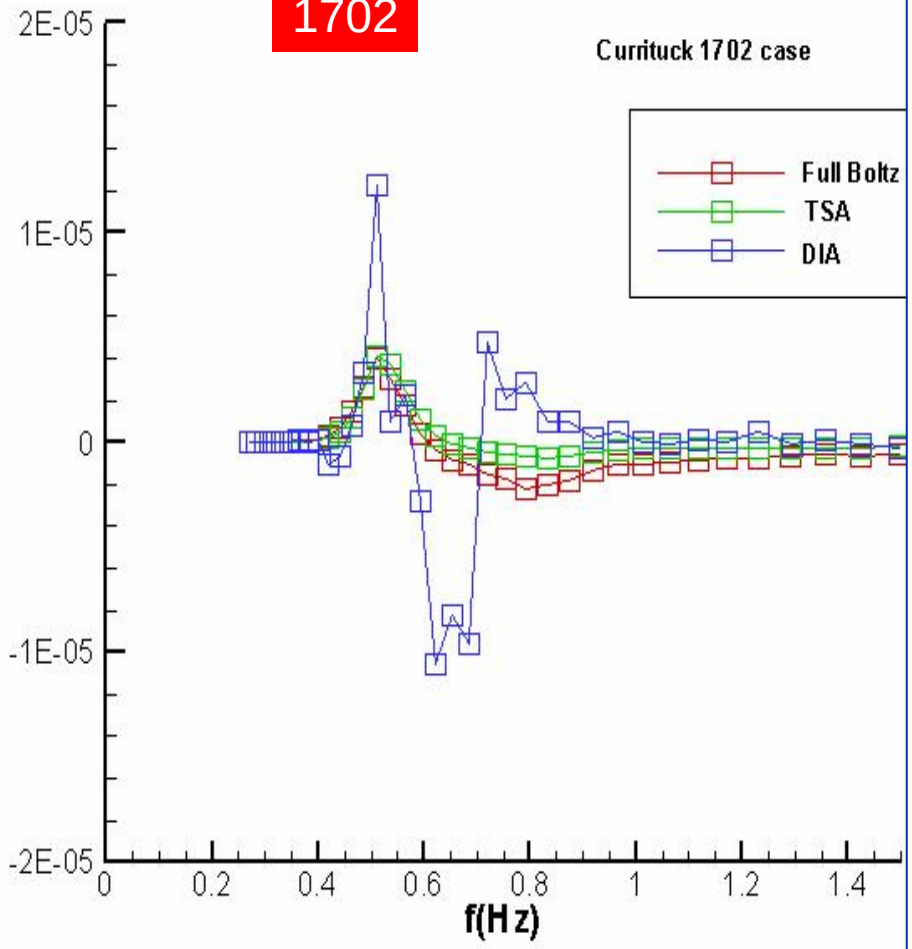


1304

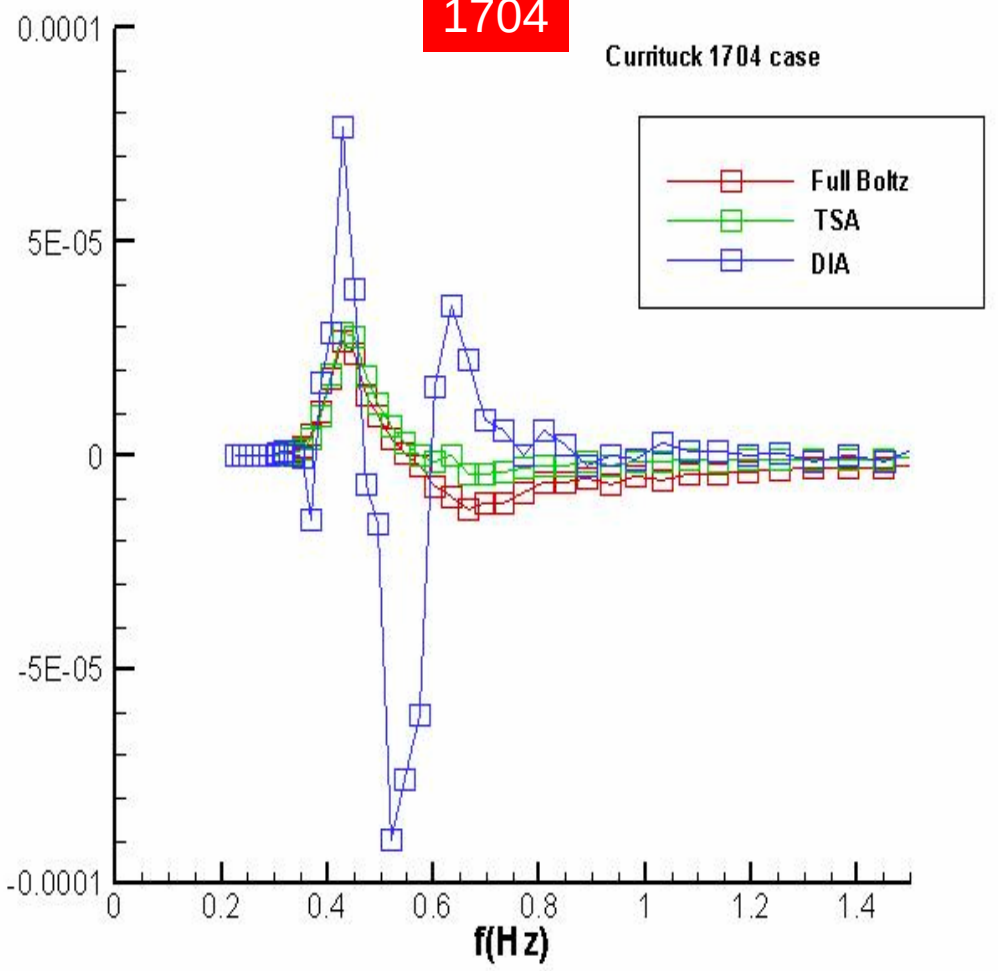


Currituck spectral cases

1702



1704

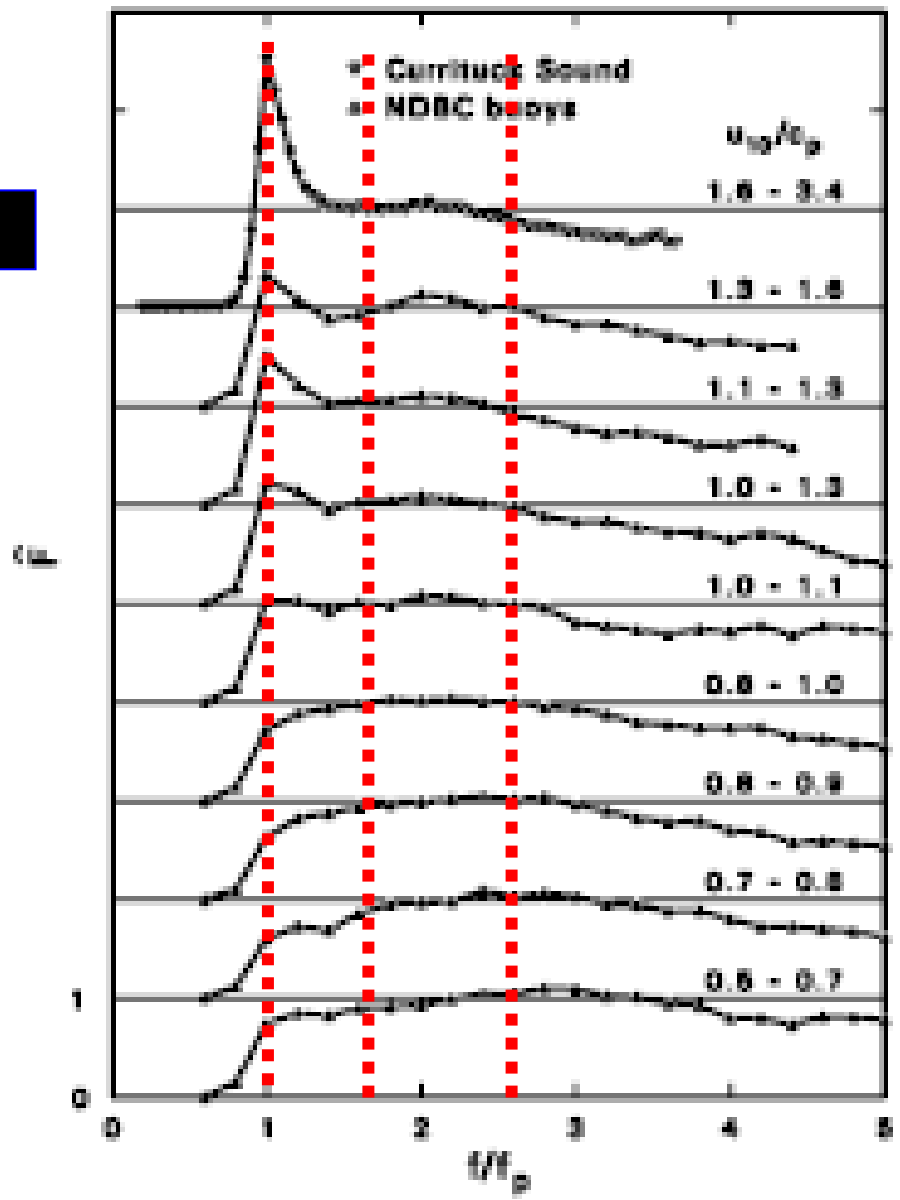


Balance in observed data

Resio et al. 2004: Currituck Sound data

Regions of interest:

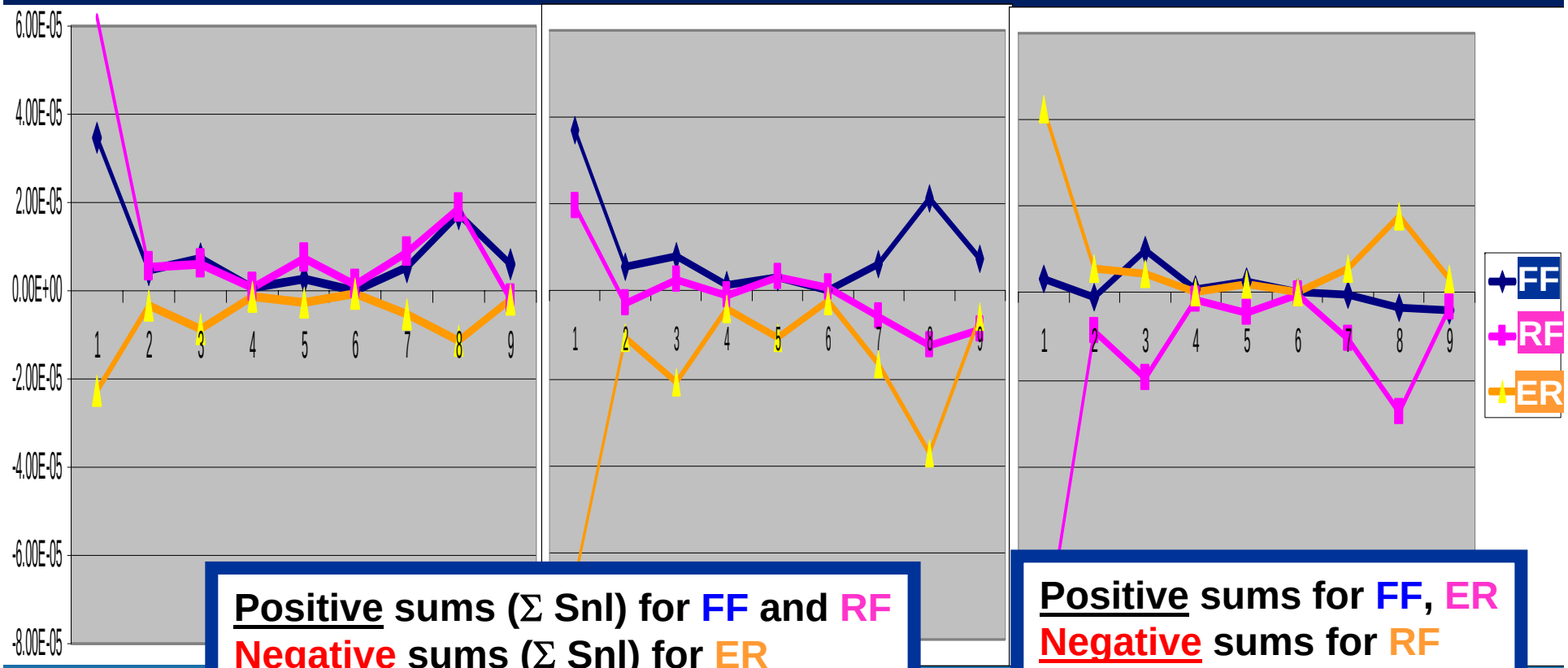
1) < fp
2) > fp and < 1.6 fp
3) > 1.6 fp and < 2.5 fp



Balance Sums

Series 1: < fp
Series 2: > fp and < 1.6 fp
Series 3: > 1.6 fp and < 2.5 fp

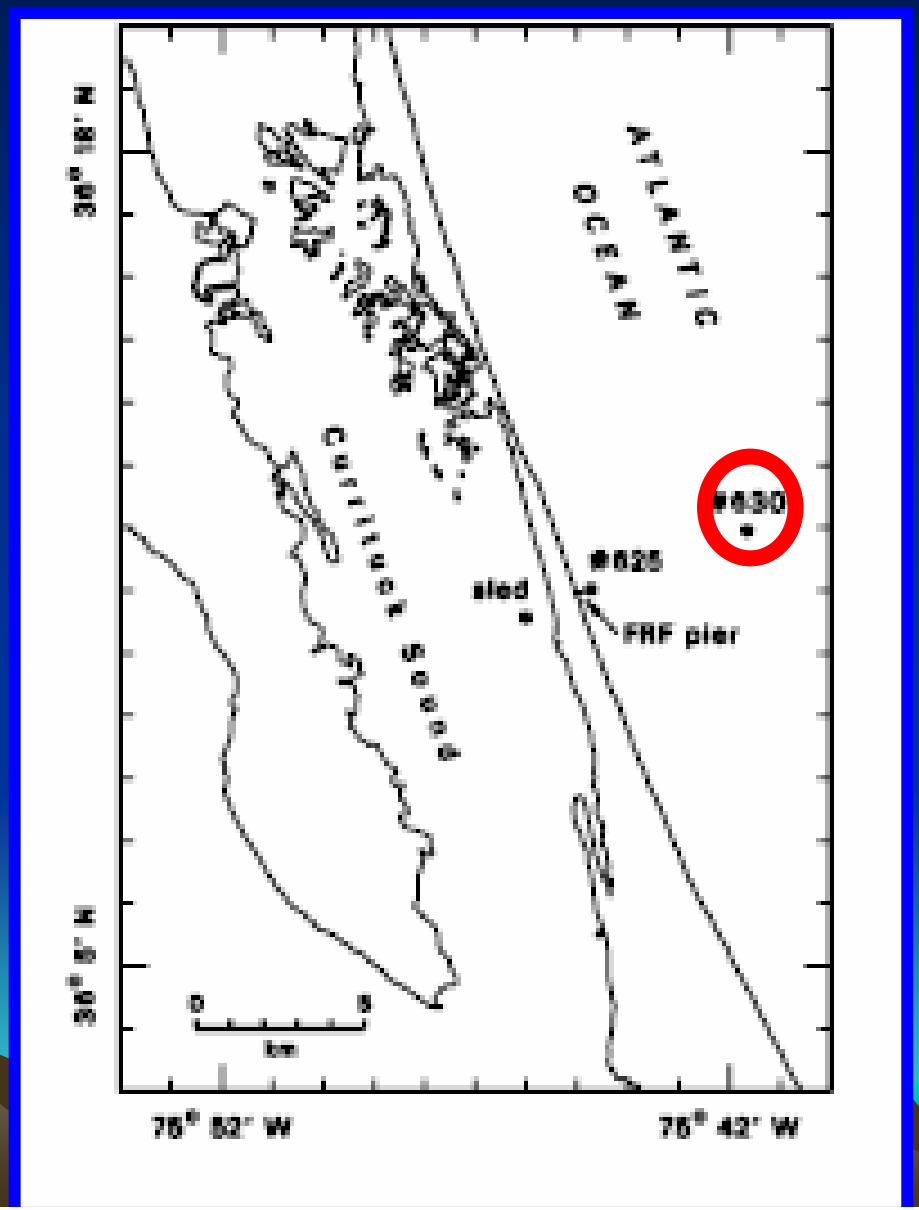
Forward Face: FF
Rear Face: RF
Equilibrium Range: ER



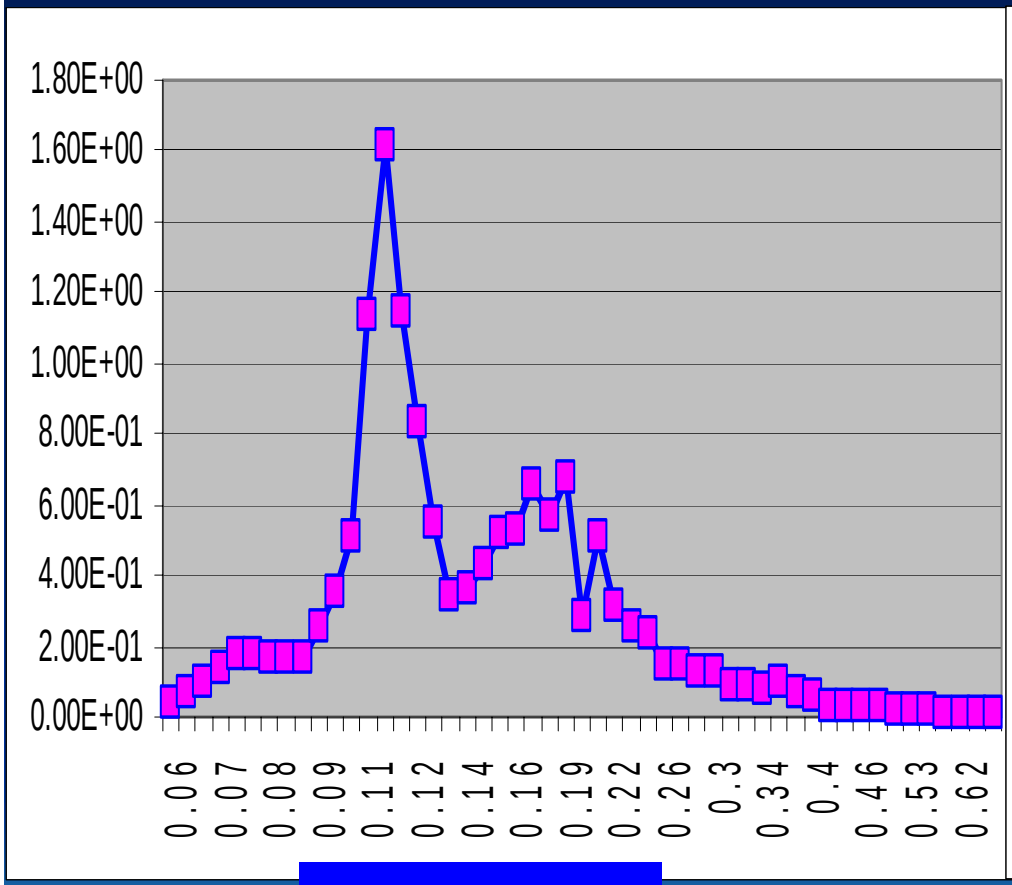
Positive sums (Σ Snl) for **FF** and **RF**
Negative sums (Σ Snl) for **ER**

Positive sums for **FF**, **ER**
Negative sums for **RF**

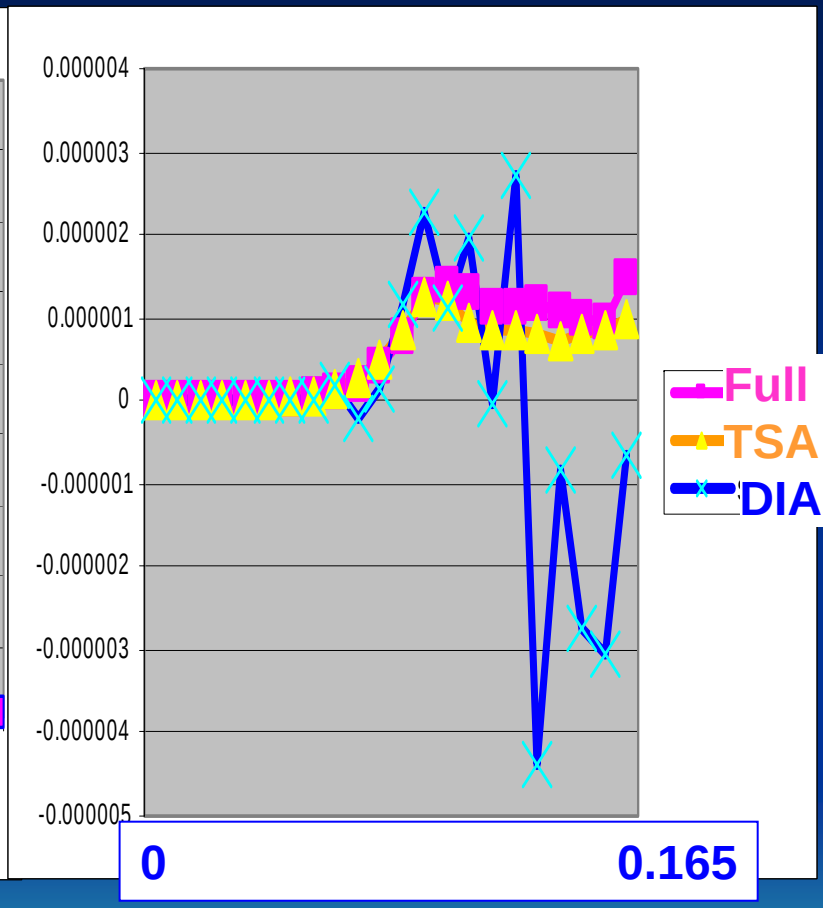
FRF waverider spectra



FRF waverider spectra

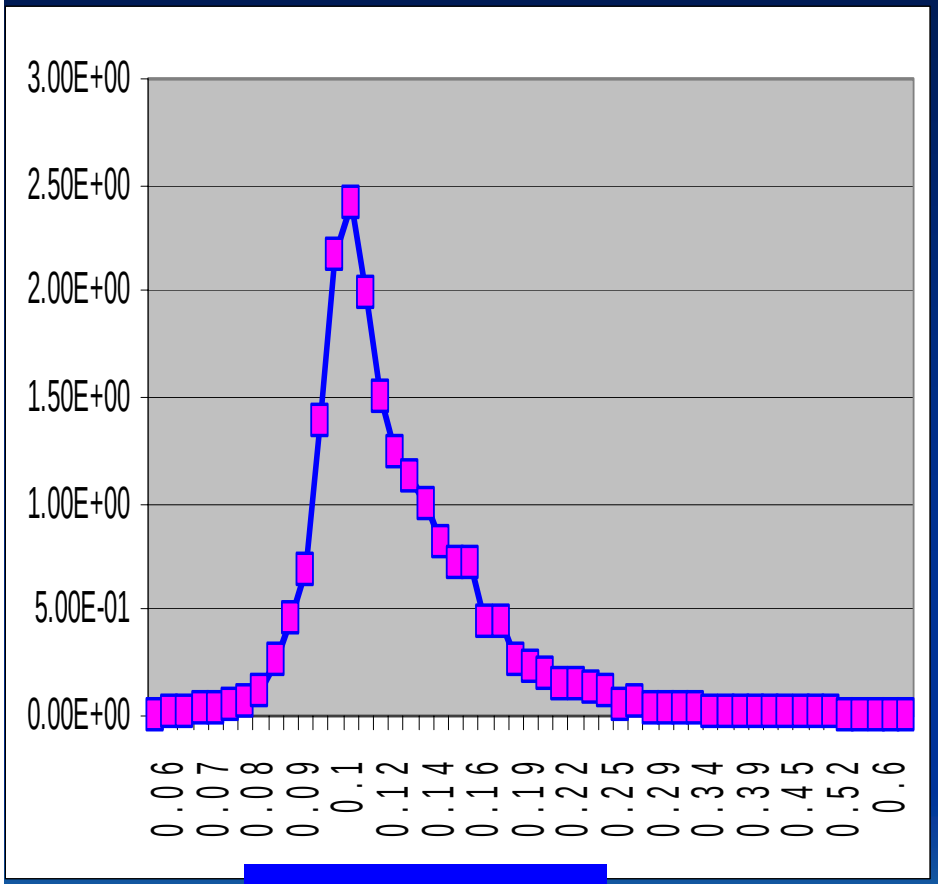


1-d energy

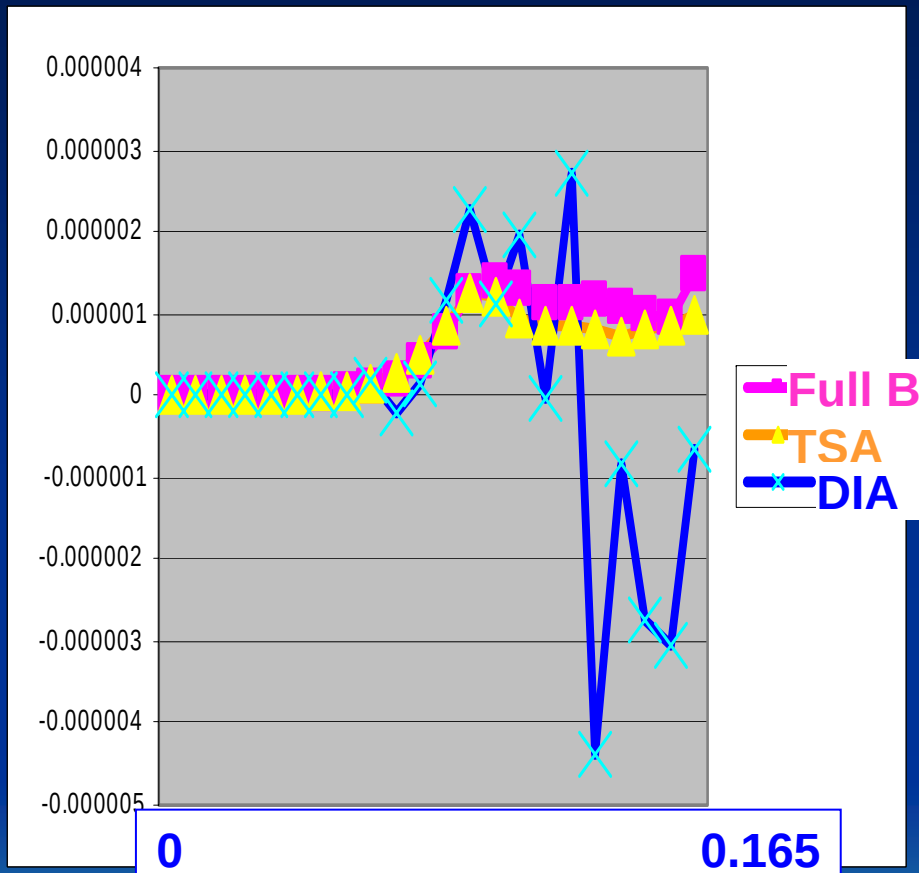


Oct. 1, 2005 1UTC

FRF waverider spectra

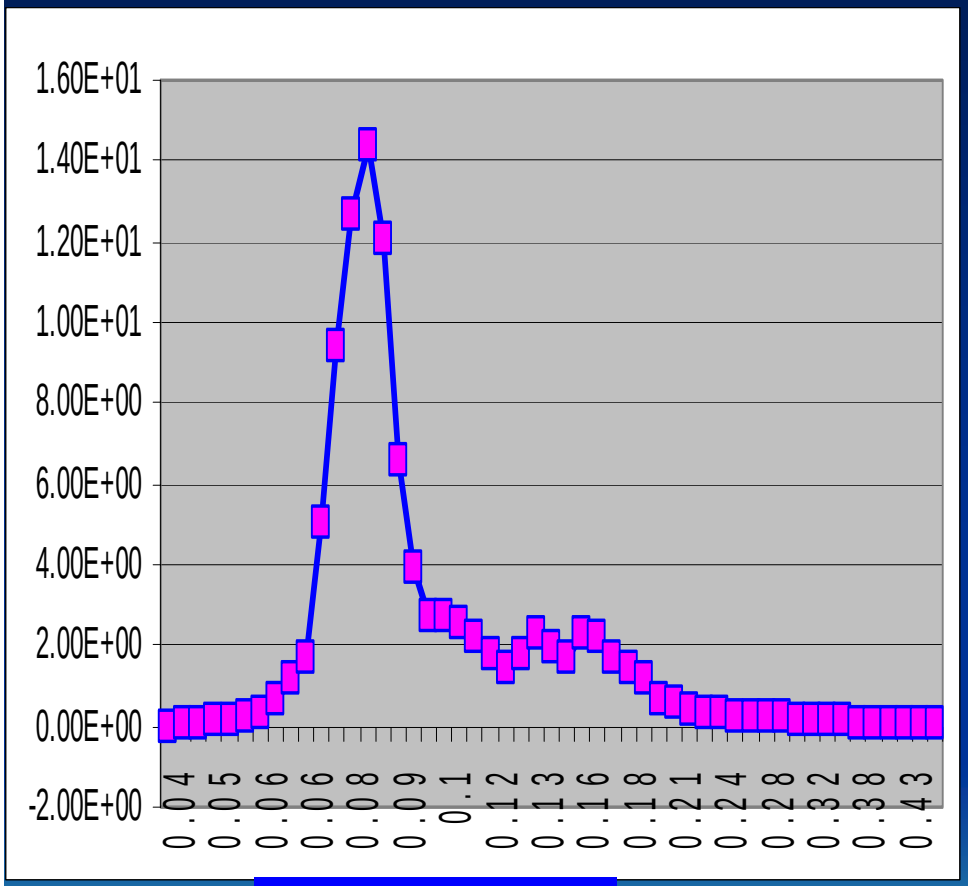


1-d energy

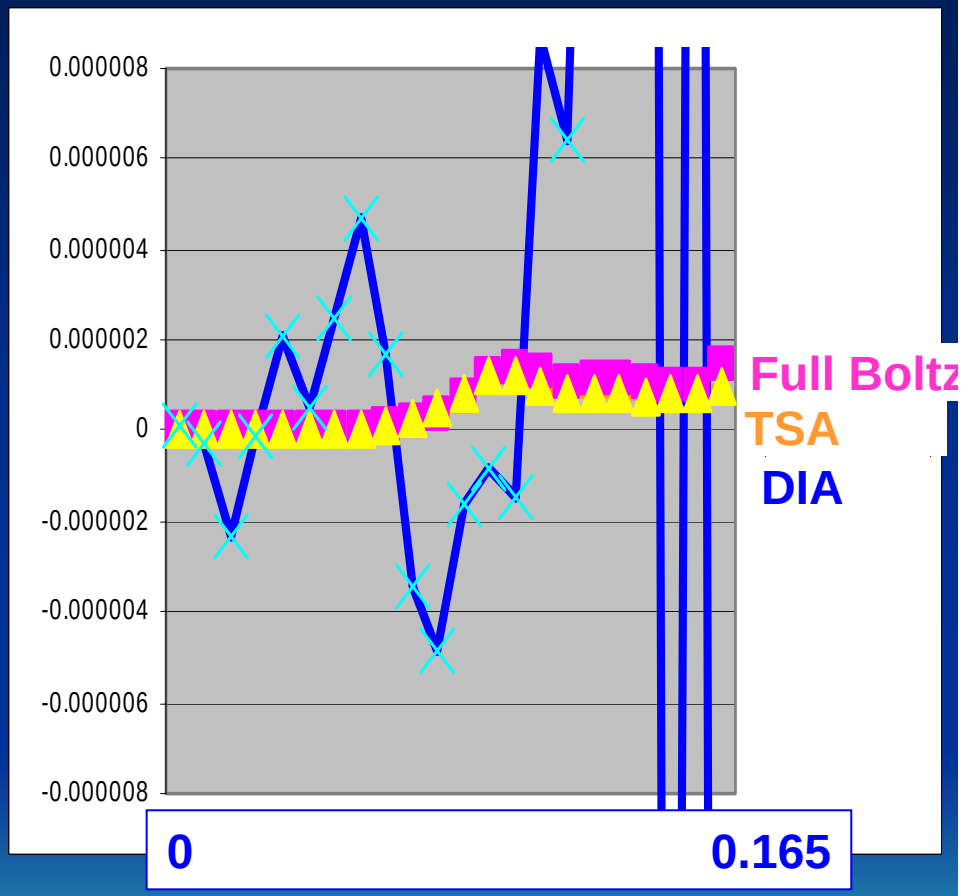


Oct. 9, 2005 1UTC

FRF waverider spectra

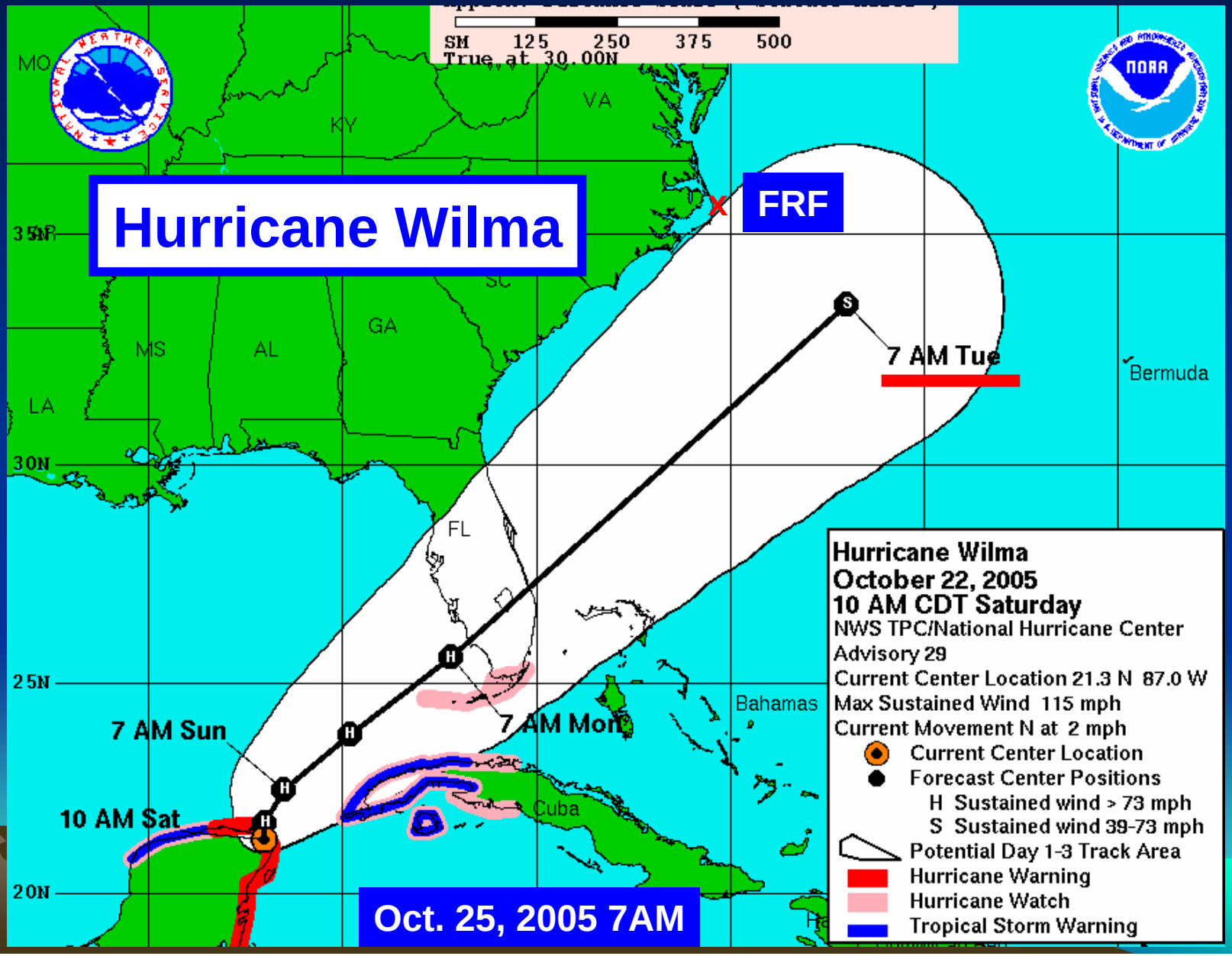


1-d energy

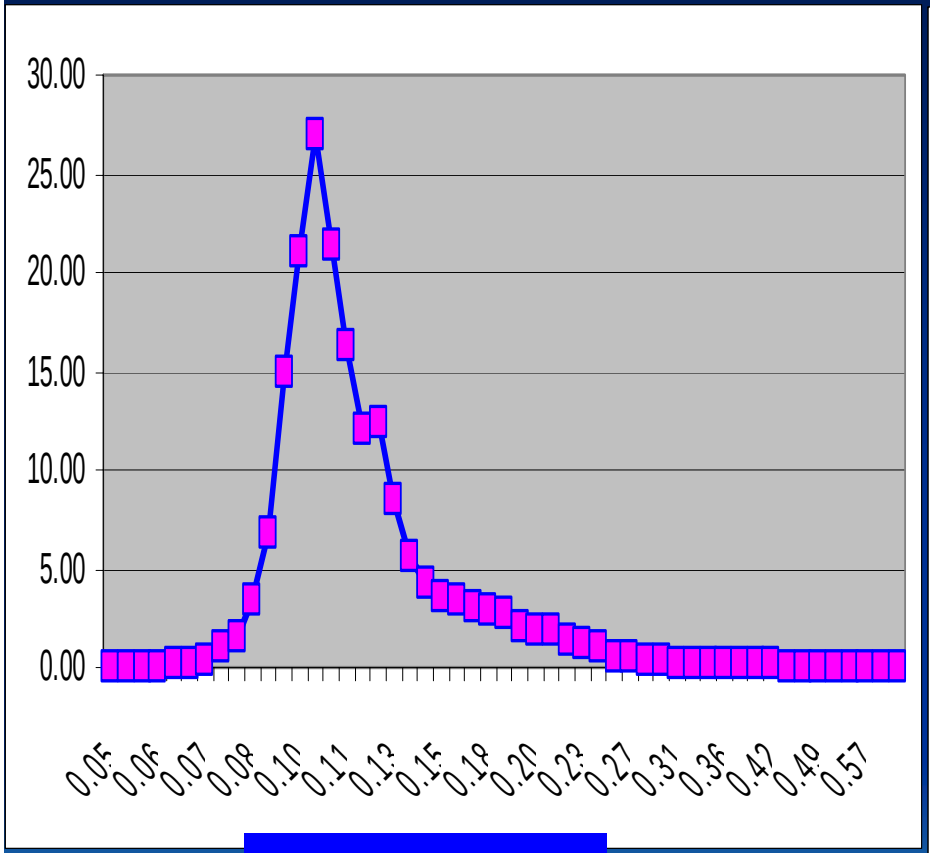


Oct. 15, 2005 1UTC

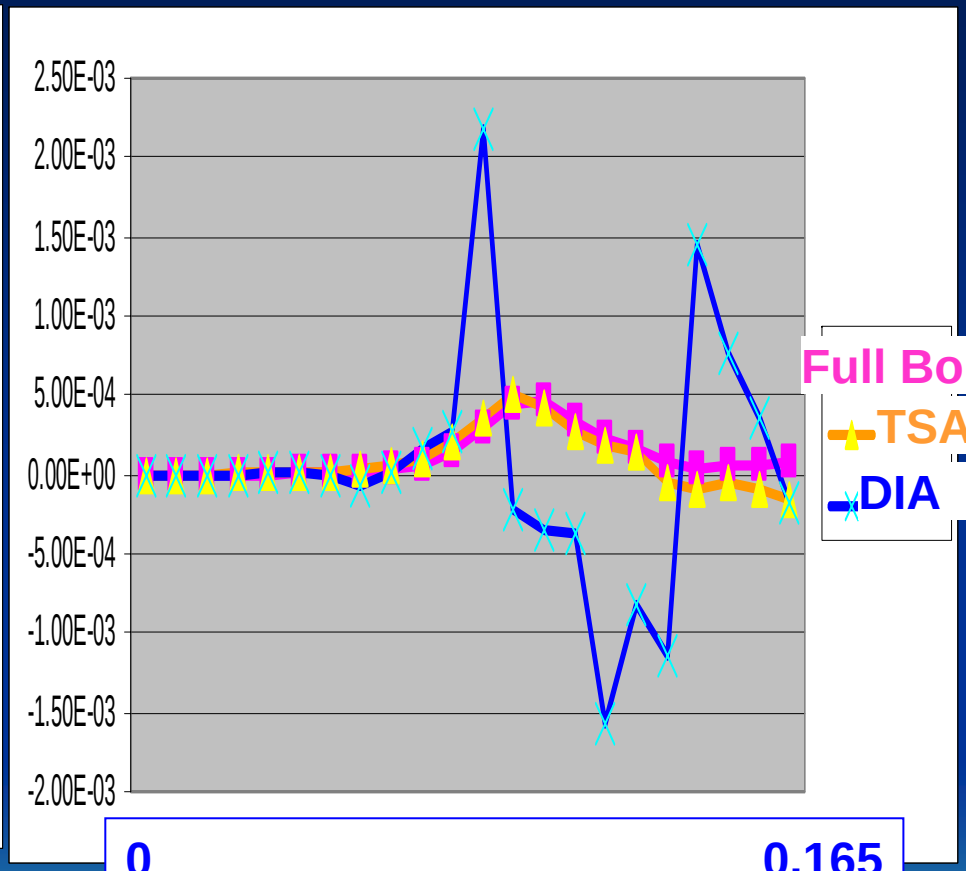
FRF waverider spectra



FRF waverider spectra

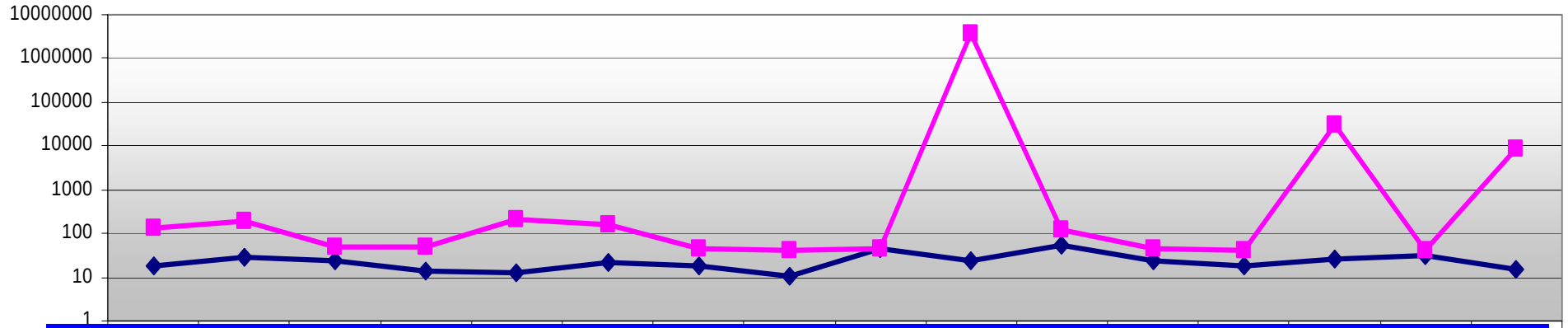


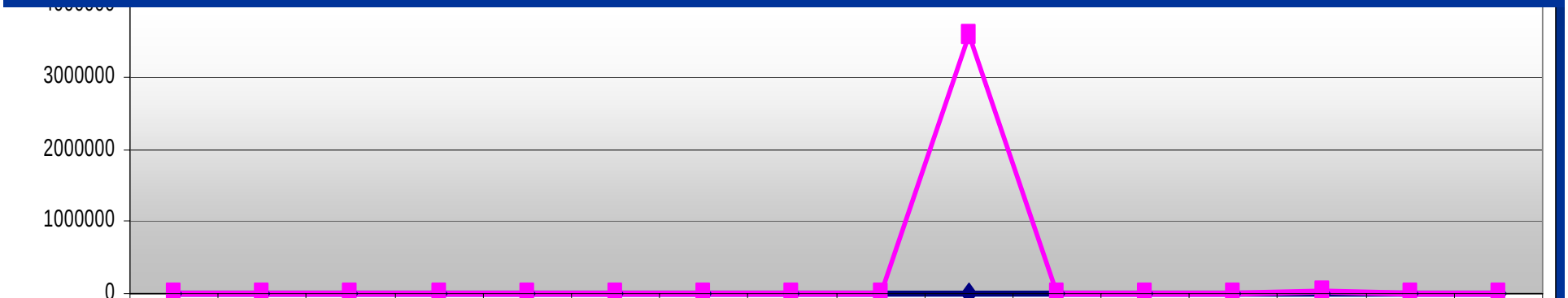
1-d energy



Oct. 25, 2005 1UTC

FRF waverider spectra





	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Series1	17.80209	27.94908	24.58577	13.53465	13.13034	21.12027	18.24188	11.00592	43.97681	23.83188	55.82706	23.20405	17.7658	25.15669	30.90667	14.9111
Series2	137.0177	198.276	48.80313	49.1282	201.3796	157.0757	45.40865	40.87648	45.61092	3581127	125.3005	46.19062	40.23753	31790.24	41.26269	8643.972

Series 1: Std [Snl_{FB} – Snl_{TSA}] / max (Snl_{FB})

Series 2: Std [Snl_{FB} – Snl_{DIA}] / max (Snl_{FB})

Summary

1) TSA is better on the forward face than DIA
2) TSA is more stable than DIA
3) TSA better for storms - hurricane Wilma
4) Errors: TSA better than DIA
5) Future – presently putting TSA into a model