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Comparison of the Performance of MetOcean and TriAXYS Wave Buoys

Dr Jane Warne* and Joel Cabrie
In-Situ Marine Manager
Bureau of Meteorology

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Overview

- Background to the experiment
- Description of the Buoy Siting and arrangement
  - locations and separations
  - Types of buoys
- Comparison results
- Significant Wave Height
  - Max Wave Height
  - Period
  - Spectral Energy
- Conclusions

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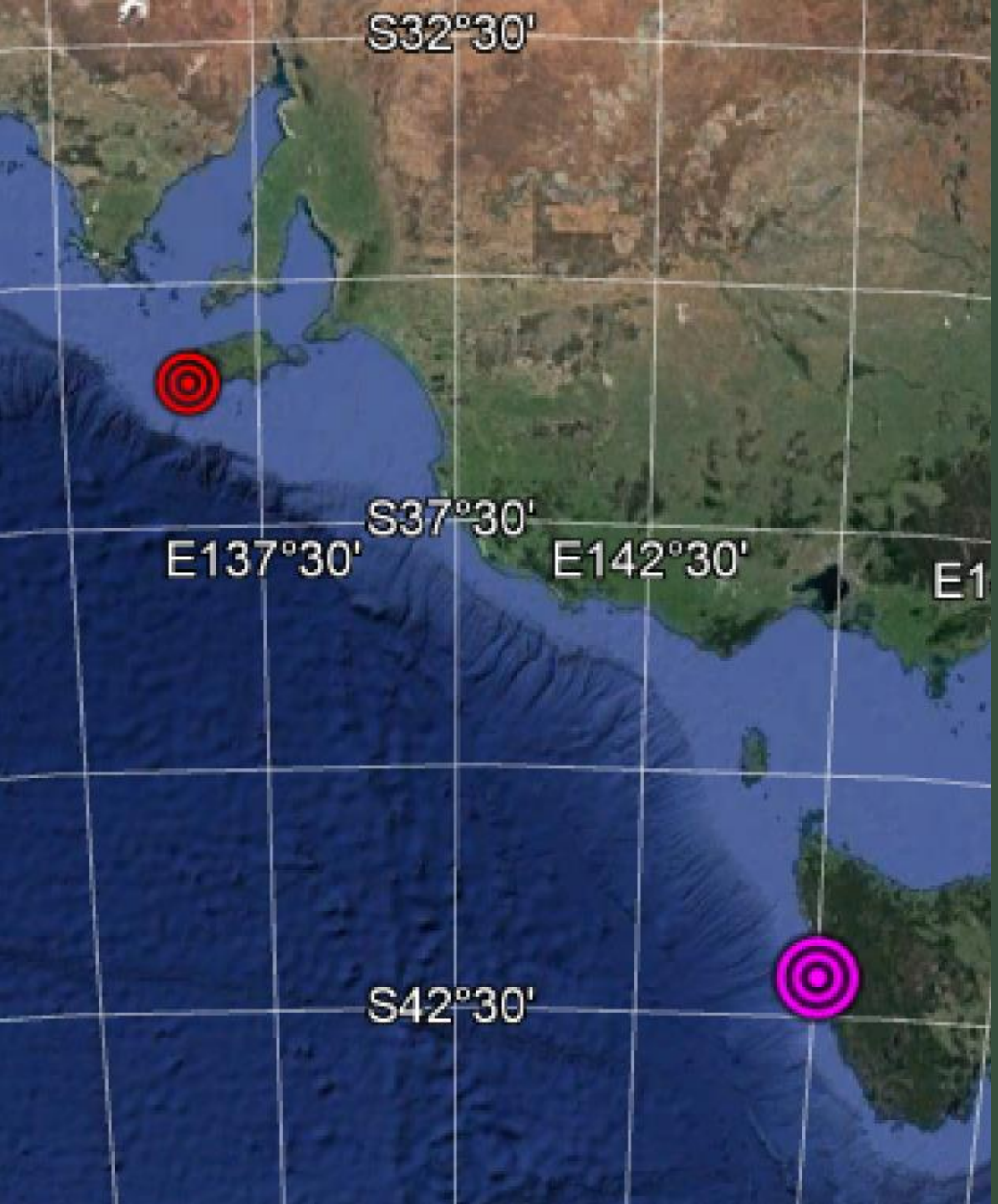
Buoy Deployment

Cape de Couedic

- Datawell MkII
- TriAXYS directional
- Approximately 200m apart
- Edge of the continental shelf
- Near Kangaroo Island, SA
- 12 March 19 to 20 Aug 19

Cape Sorrell

- Datawell MkII
- TriAXYS directional
- Approximately 200m apart
- Edge of the continental shelf
- Near Strahan, Tasmania
- 27 Feb 19 to 3 April 19



Location of Cape de Couedic and Cape Sorrell Wave Buoys

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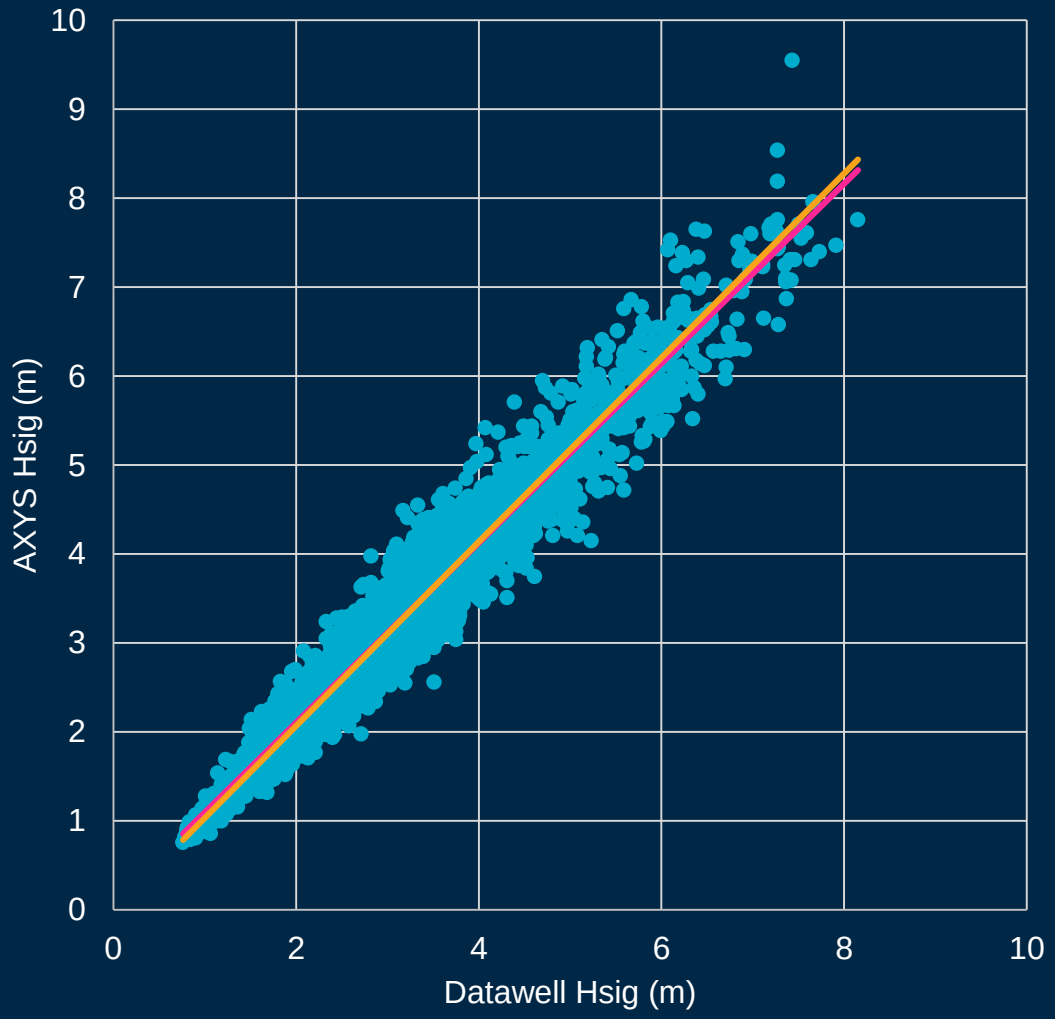
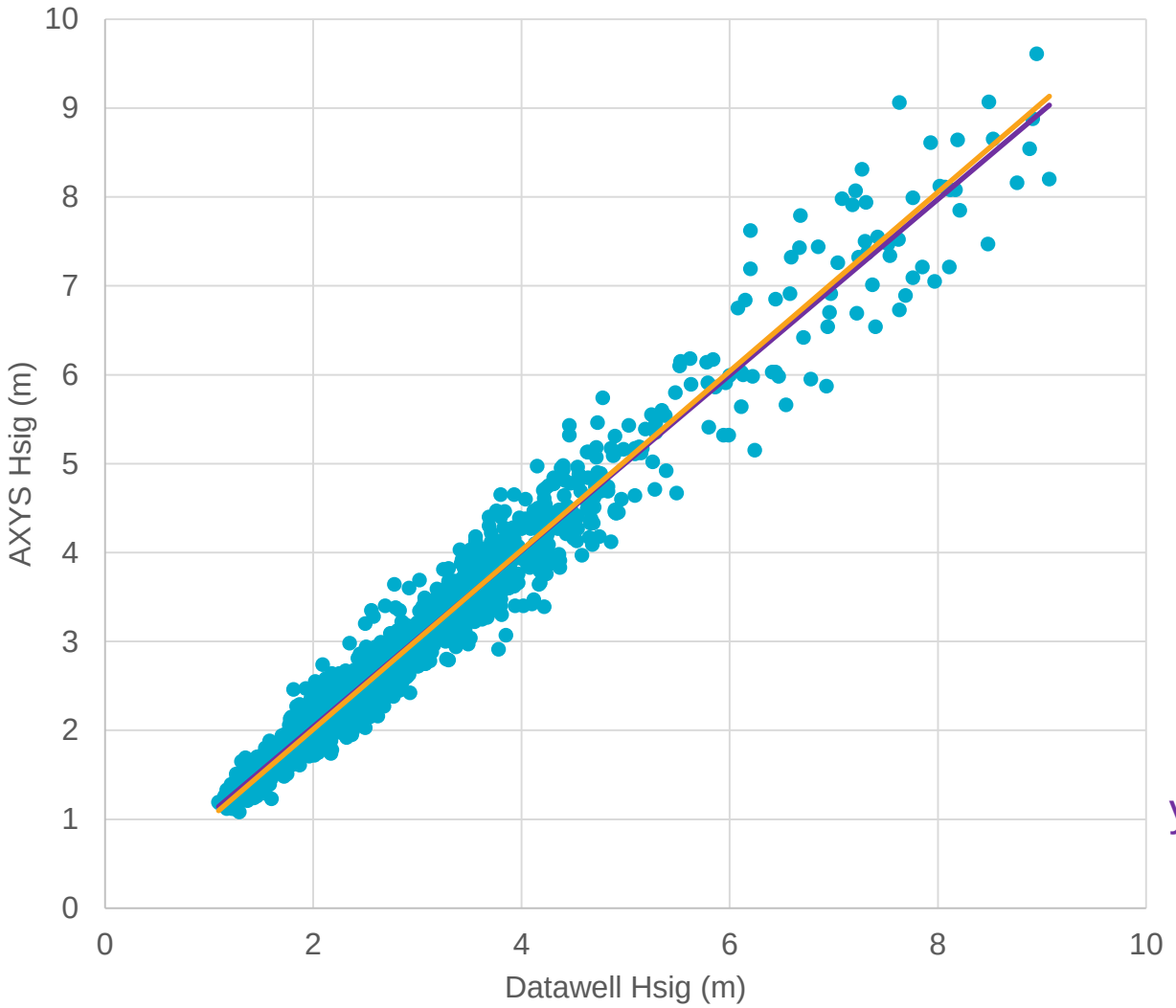
Cape de Couedic - Significant Wave Height



$y = 1.0346x$
$R^2 = 0.9514$

$y = 1.0094x + 0.0868$
$R^2 = 0.9521$

Cape Sorrell – Significant Wave Height



y = 1.0068x
R^2 = 0.9624

y = 0.9889x + 0.0623
R^2 = 0.9628

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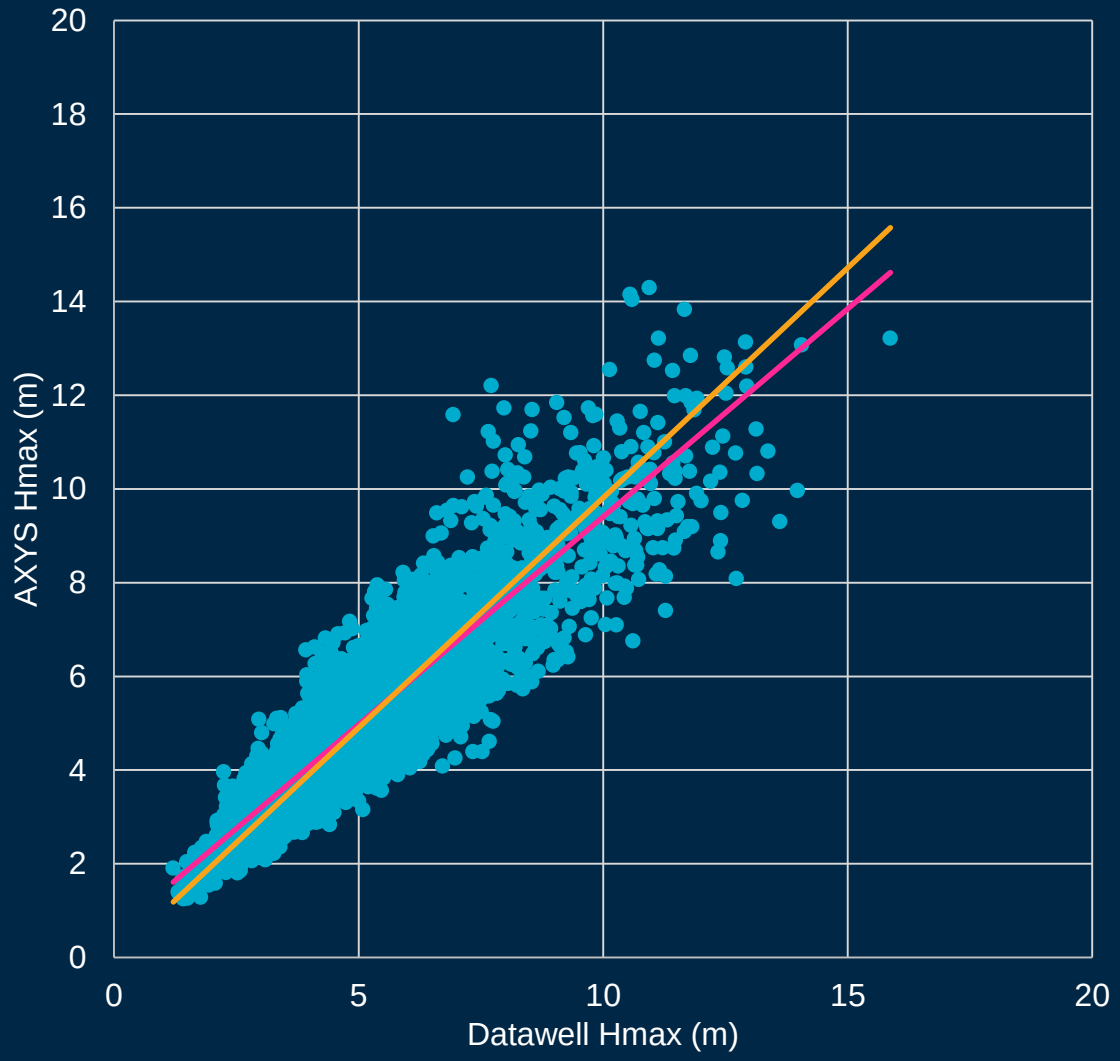
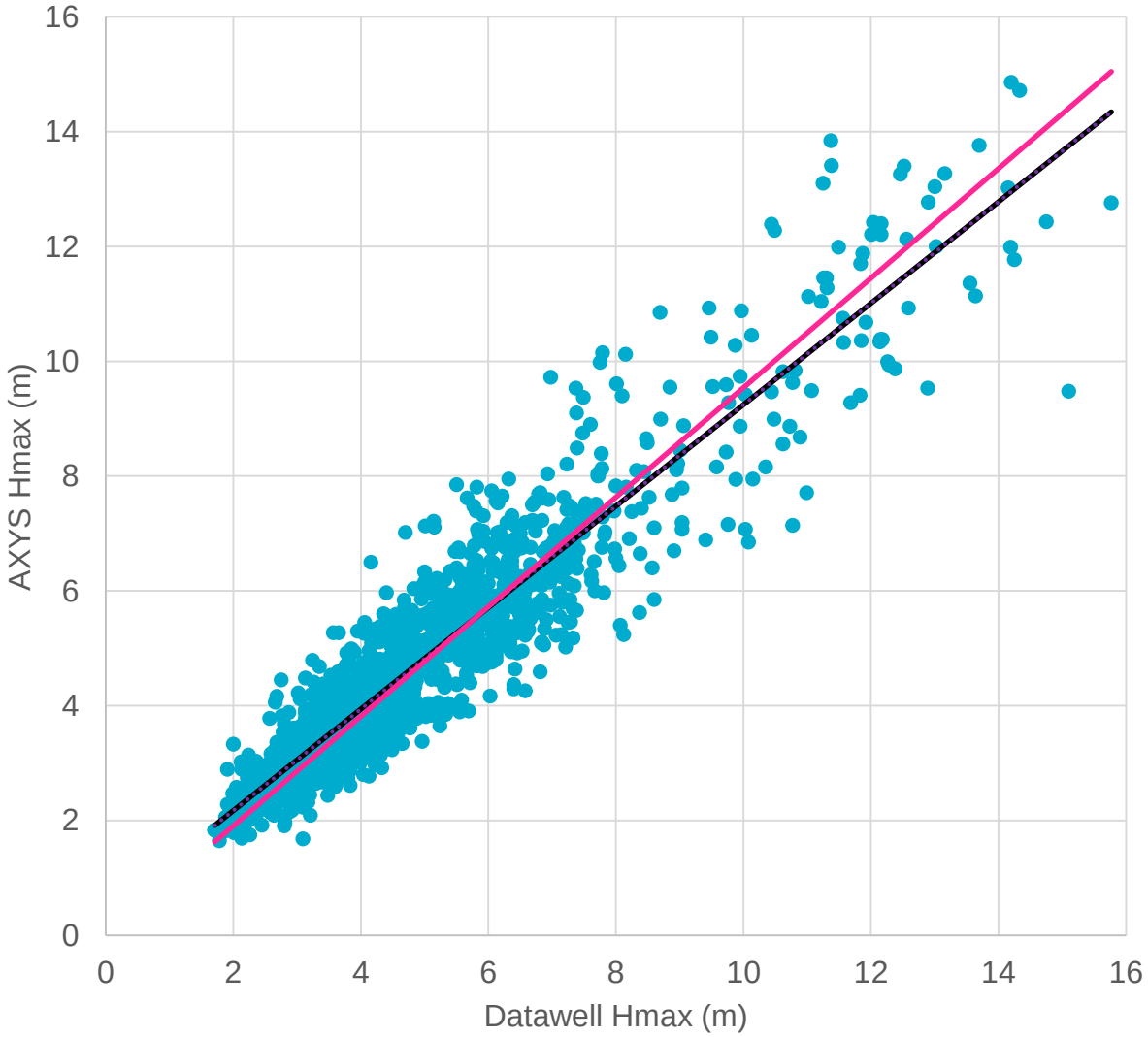
Cape de Couedic – Maximum Wave Height



$y = 0.9812x$
$R^2 = 0.827$

$y = 0.8873x + 0.538$
$R^2 = 0.838$

Cape Sorrell – Maximum Wave Height



$y = 0.954x$
$R^2 = 0.8684$

$y = 0.8838x + 0.4044$
$R^2 = 0.8751$

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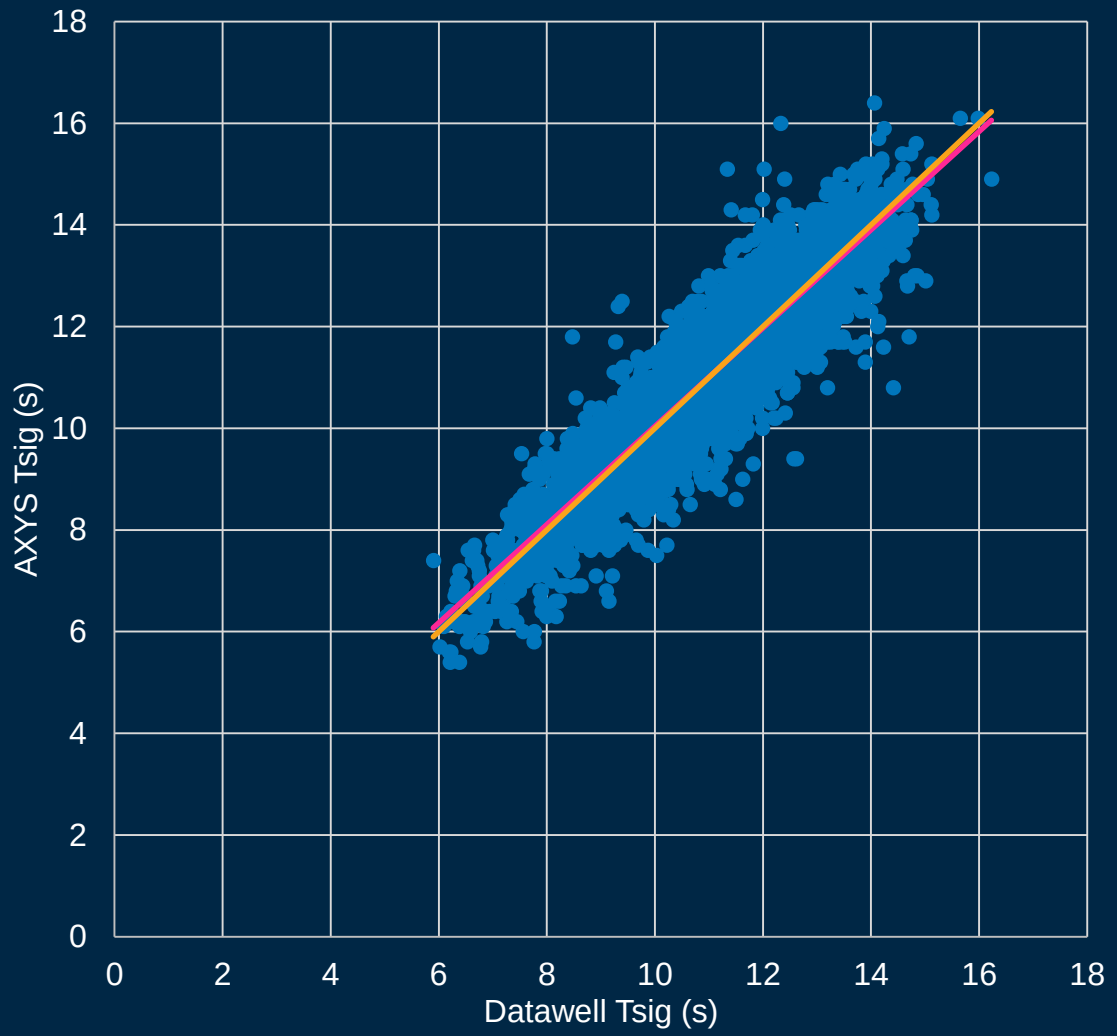
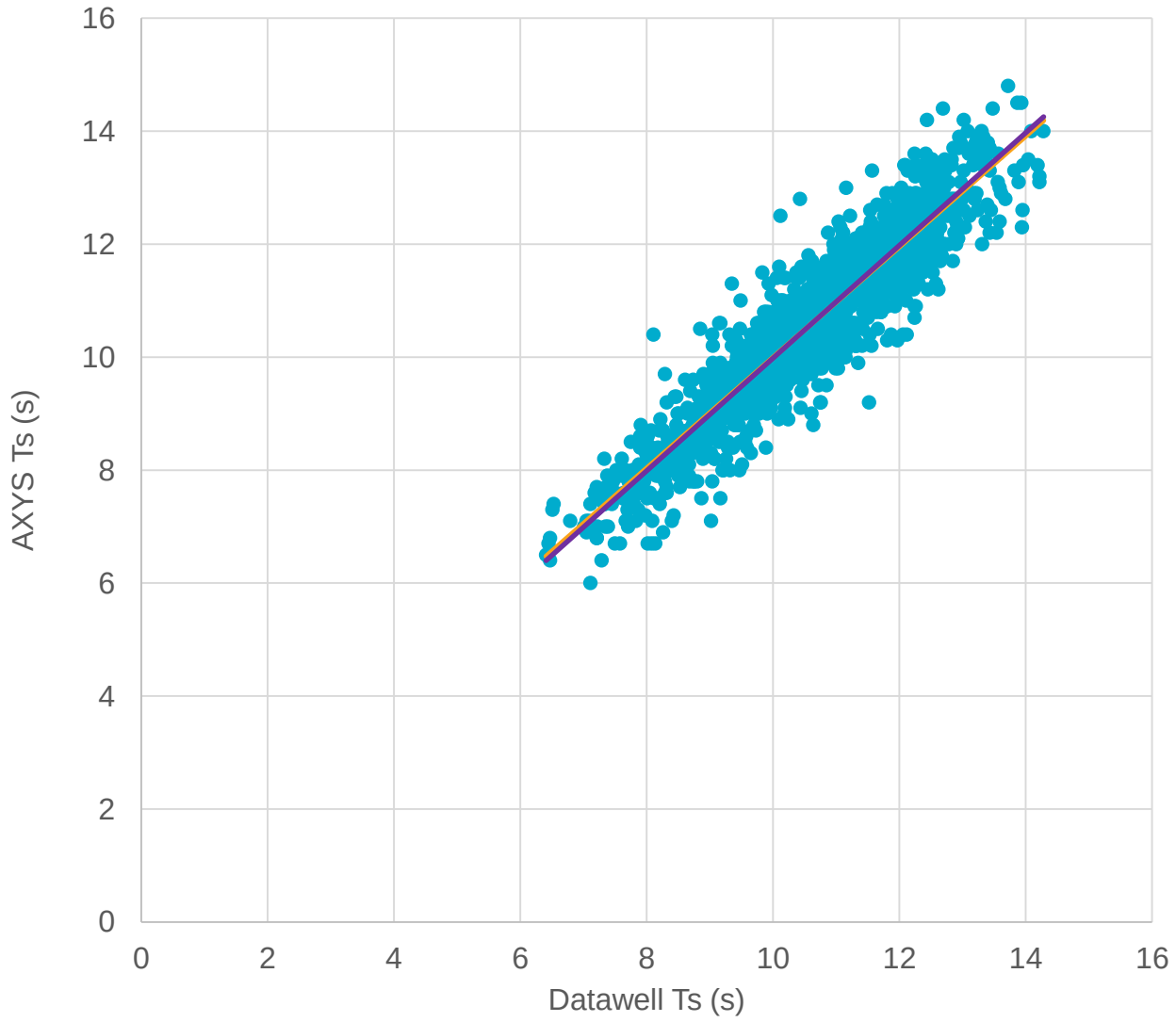
Cape de Couedic – Significant Wave Period



$y = 1x$
$R^2 = 0.8428$

$y = 0.9667x + 0.371$
$R^2 = 0.8438$

Cape Sorrell – Significant Period



$y = 0.9981x$
$R^2 = 0.8571$

$y = 0.9808x + 0.1864$
$R^2 = 0.8574$

Overall Error

Cape Sorrell

	M1	SE1	C1	SE1	R	M	SE	R
Hs	0.989	0.005	0.062	0.015	0.963	1.007	0.002	0.994
Hmax	0.884	0.008	0.404	0.043	0.875	0.954	0.004	0.978
Ts	0.981	0.010	0.186	0.105	0.857	0.998	0.001	0.997

Cape de Couedic

	M1	SE1	C1	SE1	R	M	SE	R
Hs	1.009	0.003	0.087	0.010	0.952	1.035	0.001	0.993
Hmax	0.887	0.005	0.538	0.029	0.838	0.981	0.002	0.977
Ts	0.967	0.006	0.371	0.063	0.844	1.000	0.001	0.996

Overall Statistics for Cape de Couedic

	Have (D-A)	Hs (D-A)	Hmax (D-A)	Ts (D-A)
Average	0.171	-0.115	0.016	-0.008
Median	0.150	-0.115	0.016	-0.008
Standard Dev	0.197	0.270	0.812	0.675
Uncertainty	0.395	0.540	1.624	1.350

Chart Title

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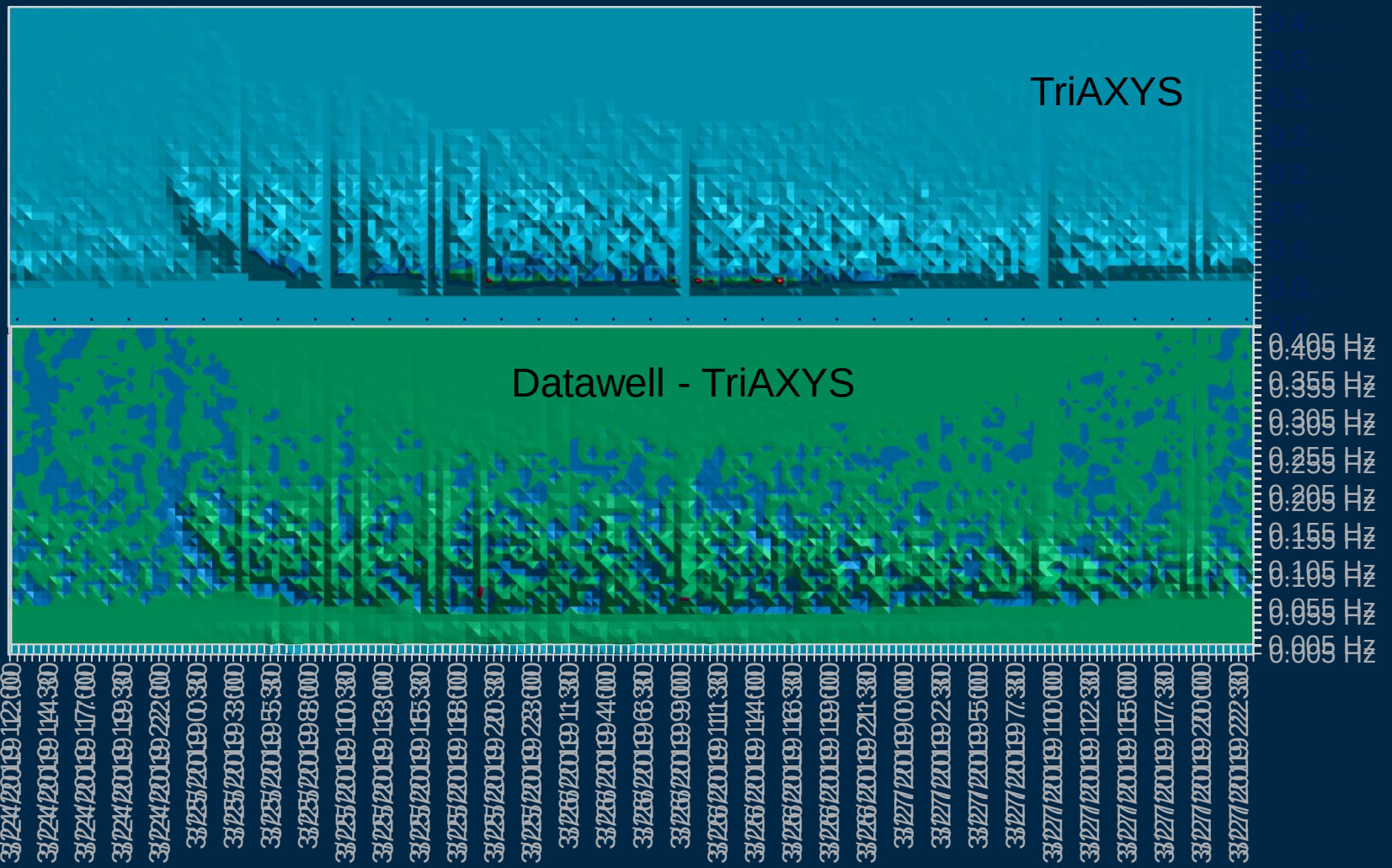
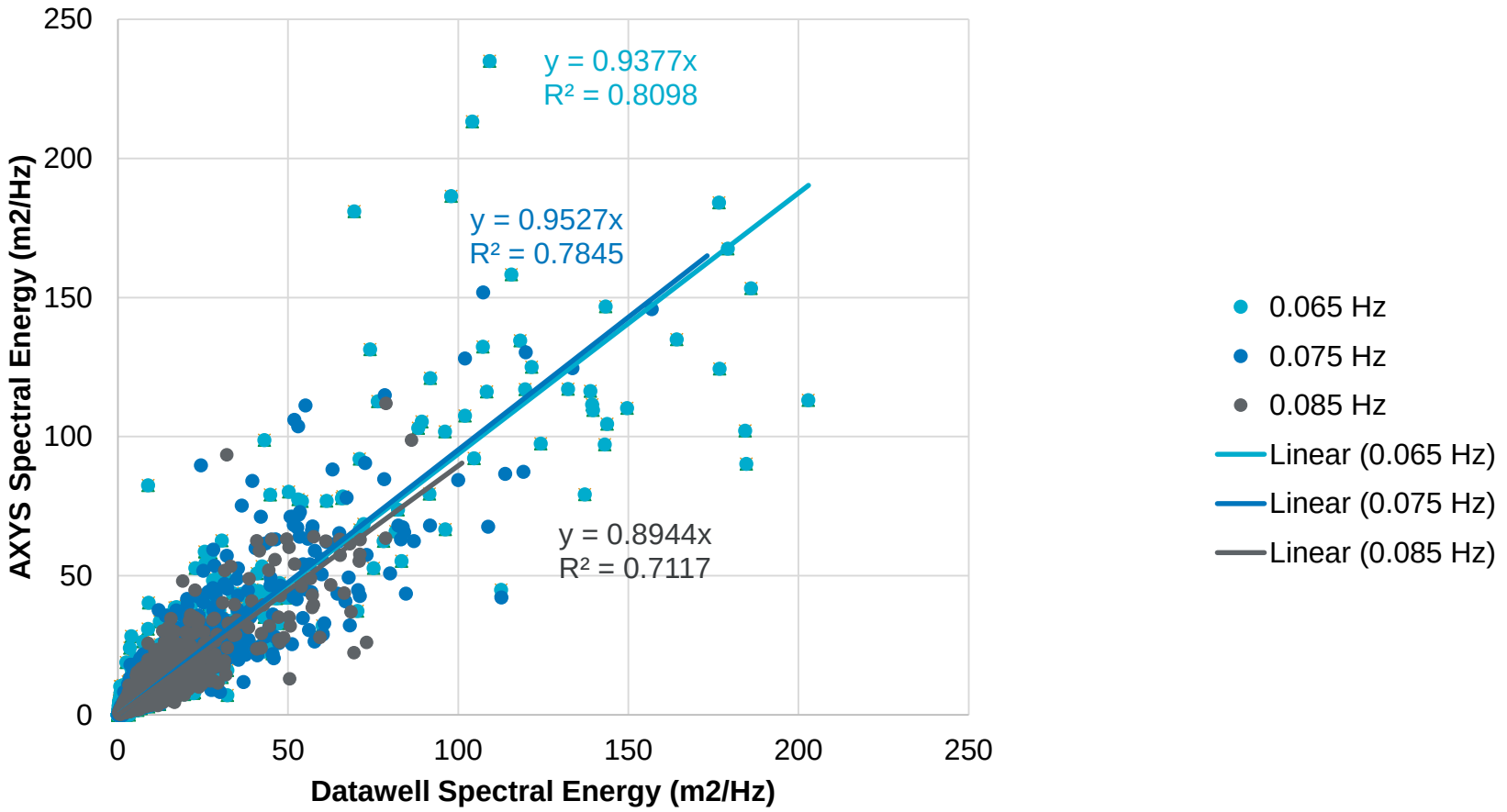
Spectra Energy Comparison



Comparison of Spectral Energy



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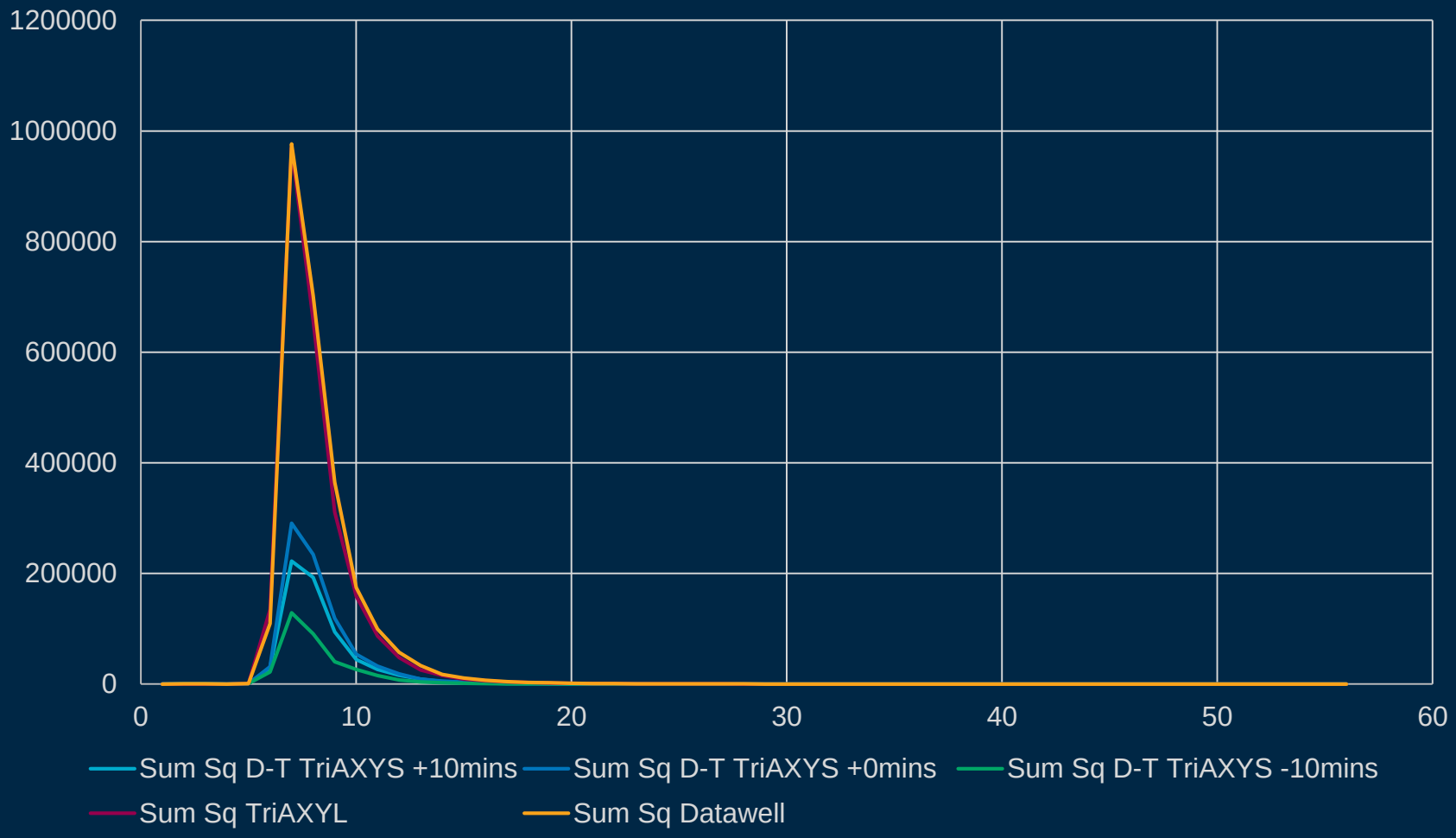
Evaluation of Possible Timing Errors



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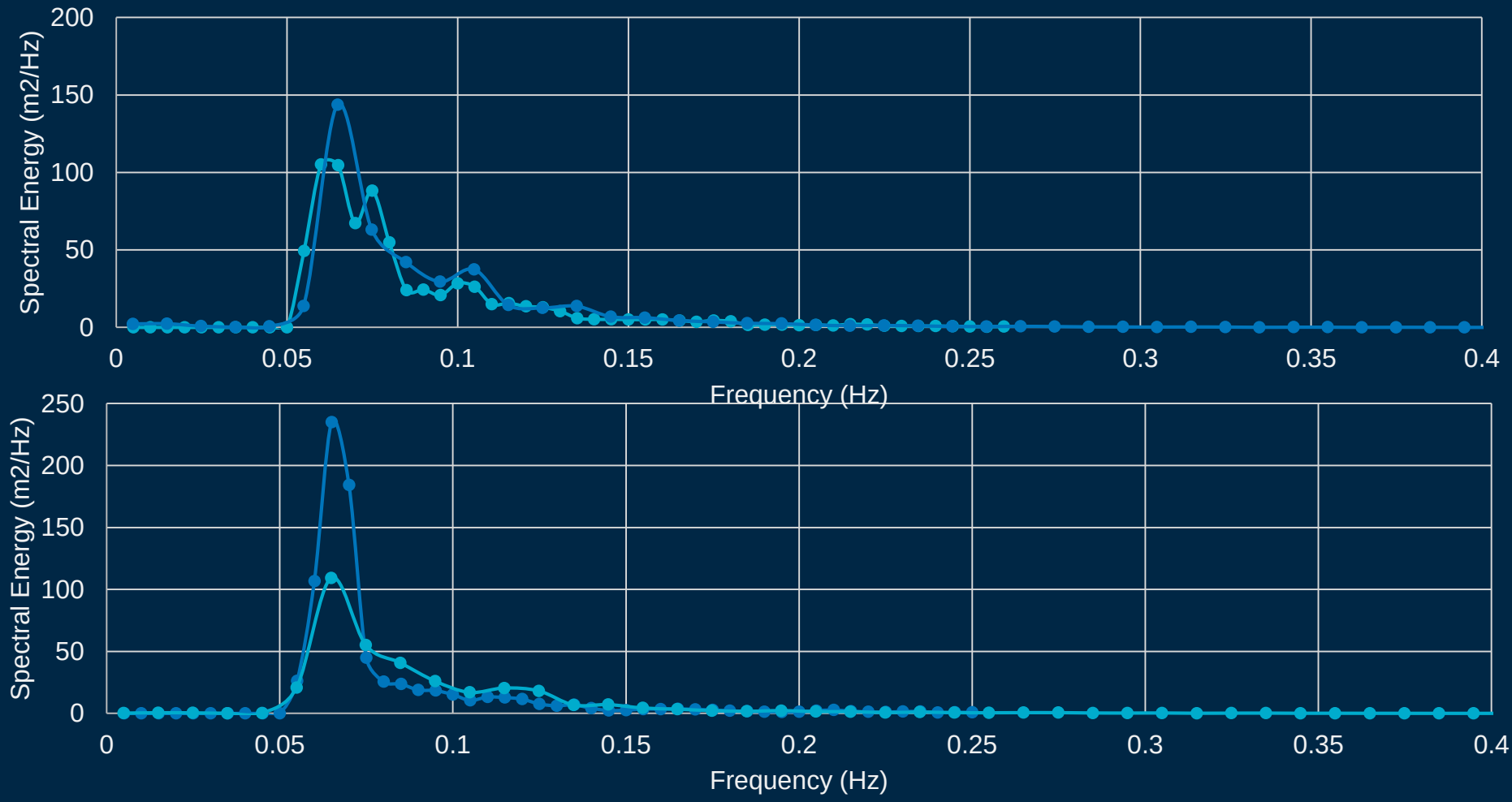
Spectral Response as a Function of Amplitude



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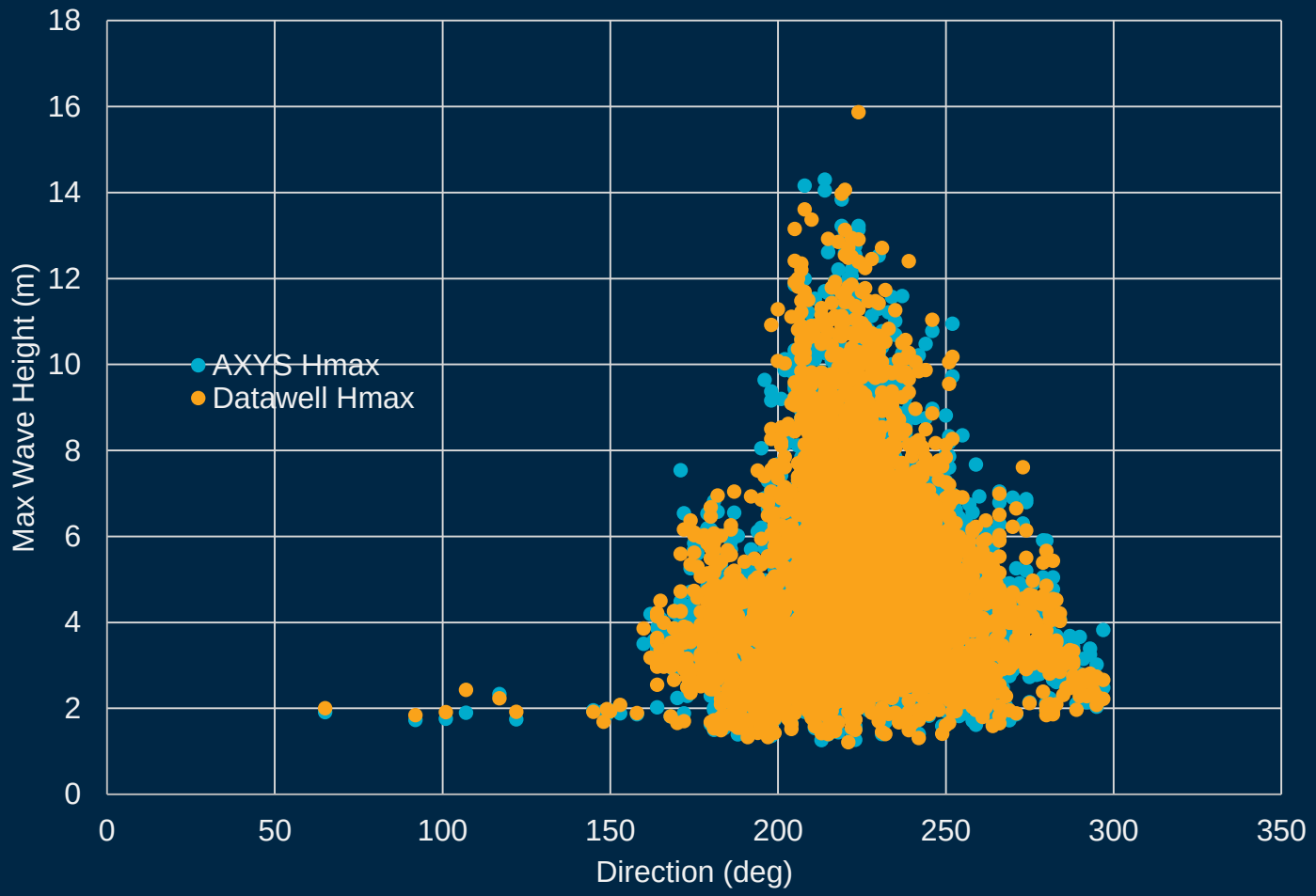
Direction Cape de Couedic



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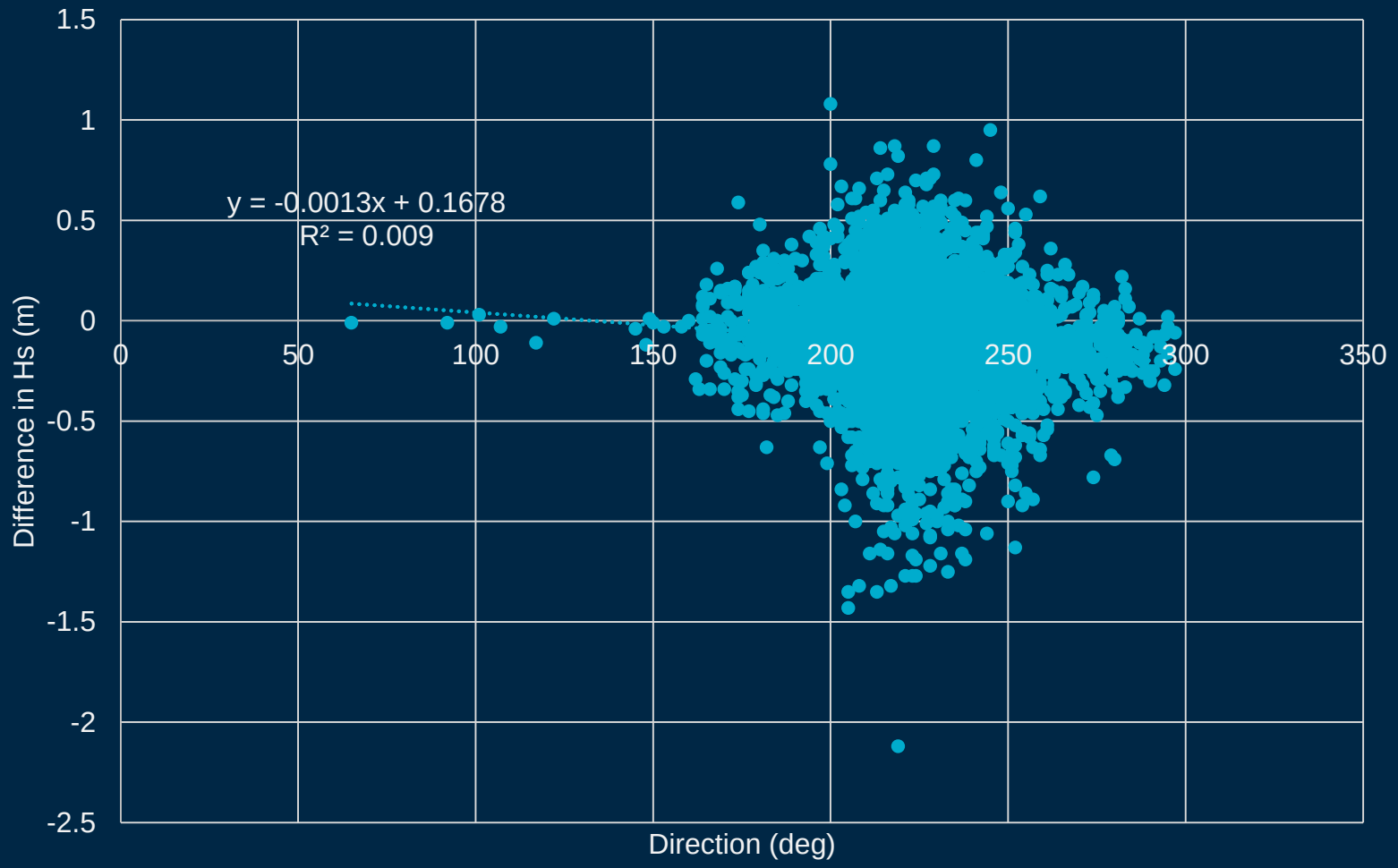
Relationship between Hsig Difference and Direction



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Conclusions

- Comparisons at both sites showed very similar results
  - Strong correlation of Wave Height and Period between the to types of buoy
  - In general less than 5% deviation in the correlation and typically less than 2%
  - The differences are generally normally distributed
  - Some of this deviation may be attributable to small deviations in timing between the two sites
- The energy spectra structurally similar however the Datawell measures lower
  - in high energy events more than 50% lower.
  - In moderate energy events appox 25% lower
- No directional influence were detected in the data

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Thank you

Contact details