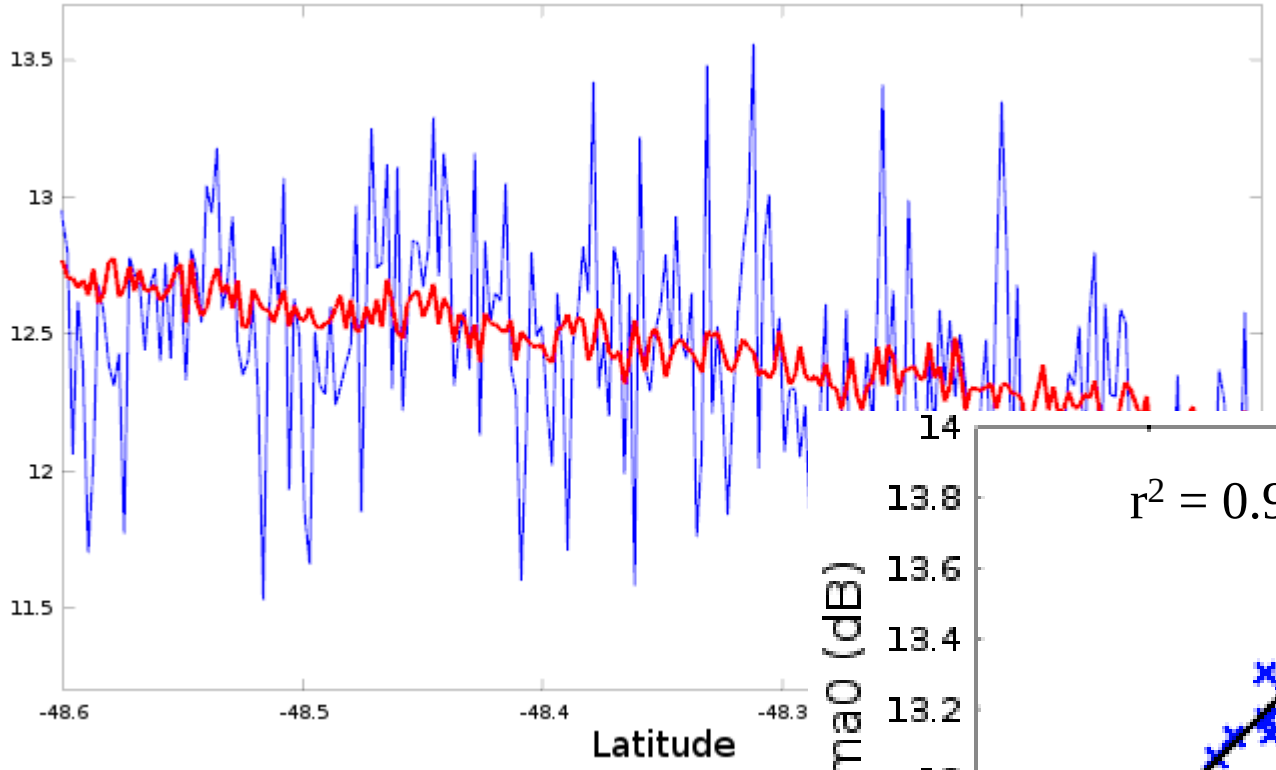
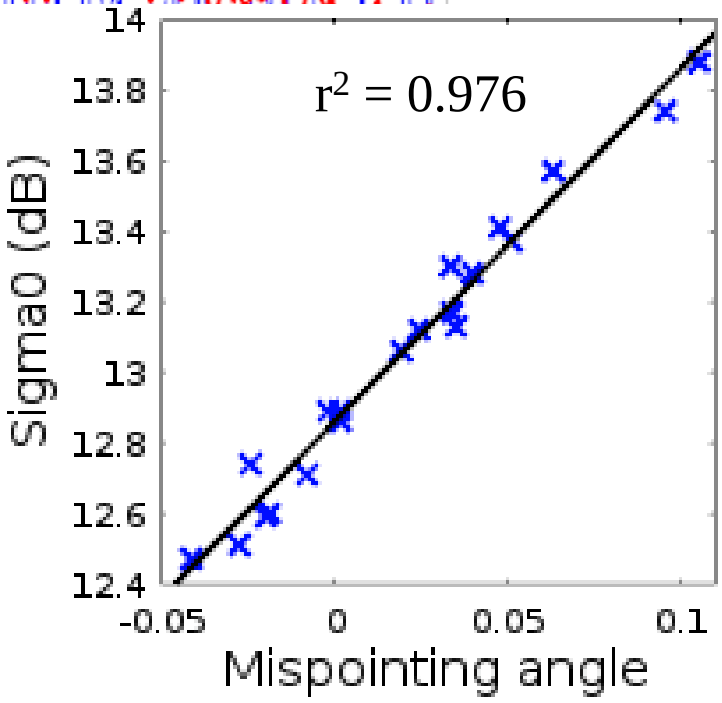
Better than Averaging:

Empirical Correction for Intra-1 Hz Correlations

Graham Quartly,
Walter Smith & Marcello Passaro





$$\sigma^0_{adj} = \sigma^0_{MLE4} - \alpha \psi^2$$

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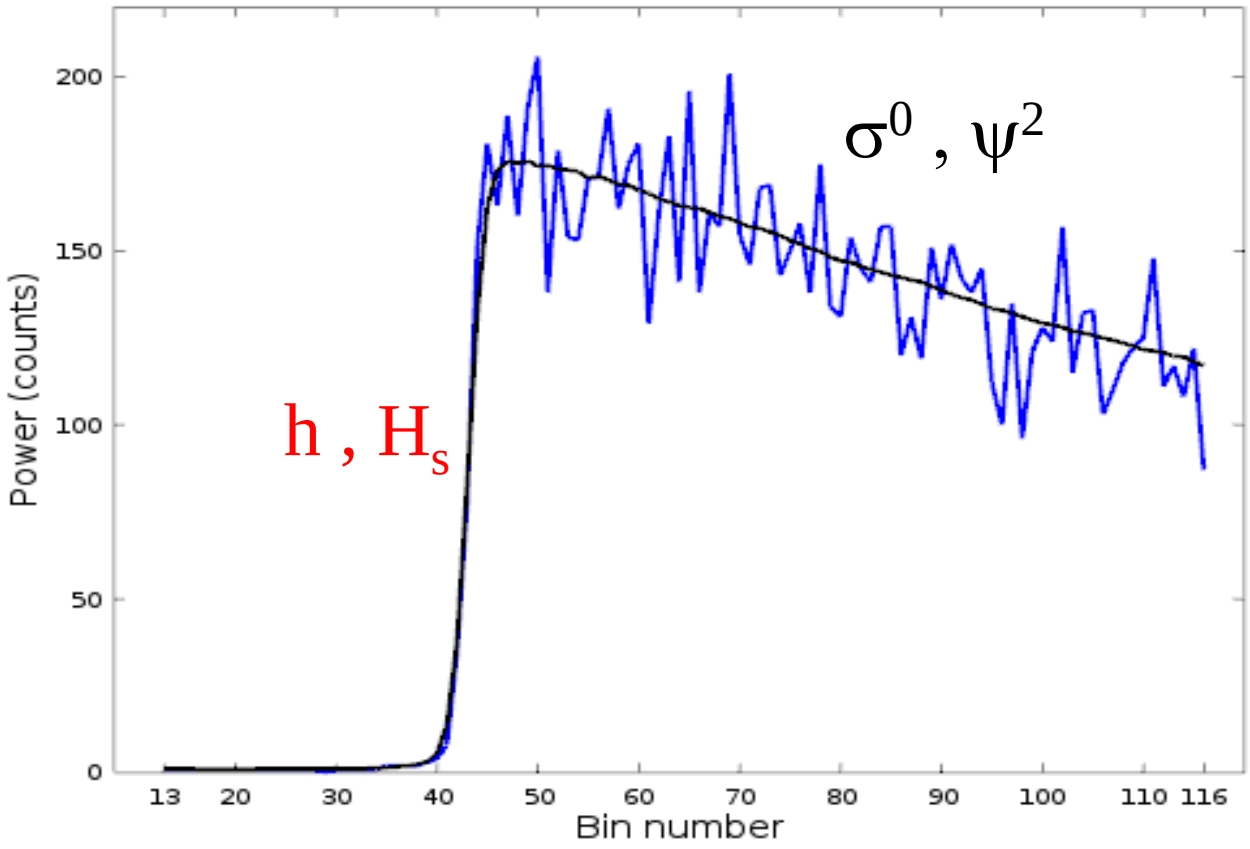
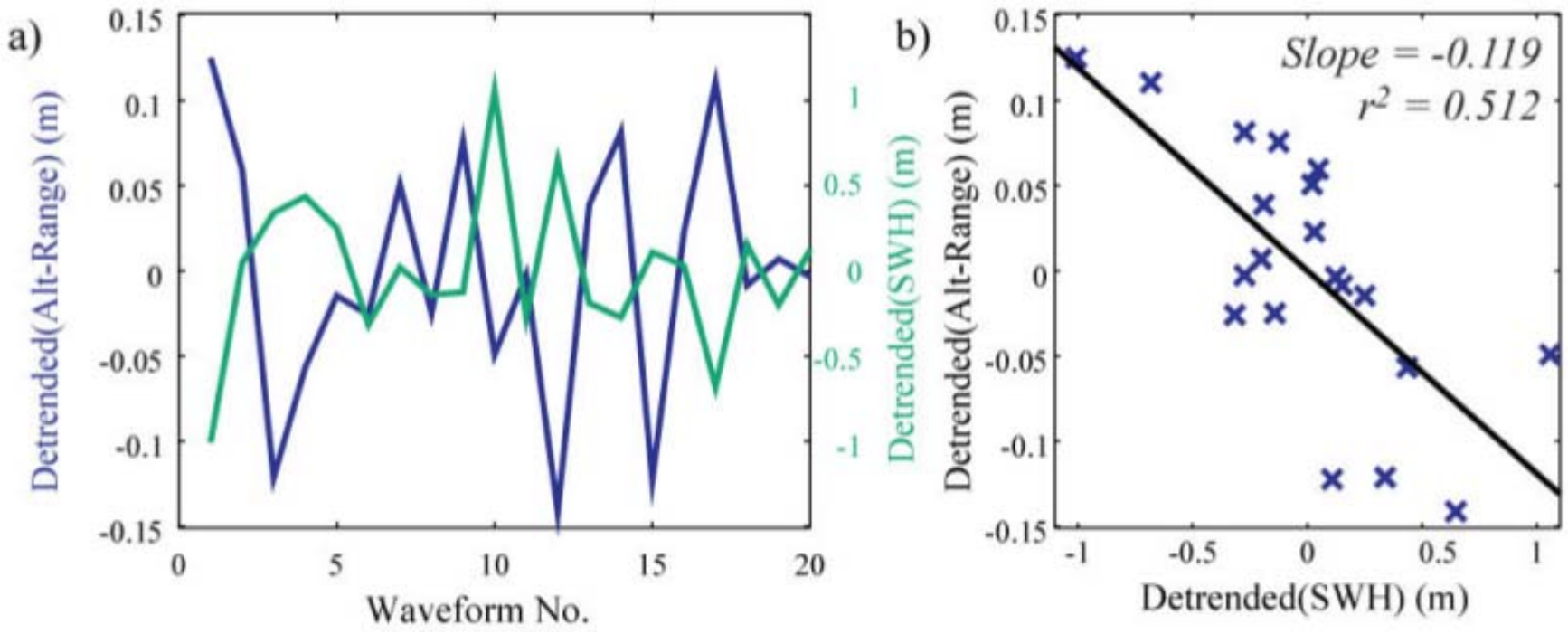
Sensitivity to fading noise



Analysis of 1 second of data

— Jason-3 data —



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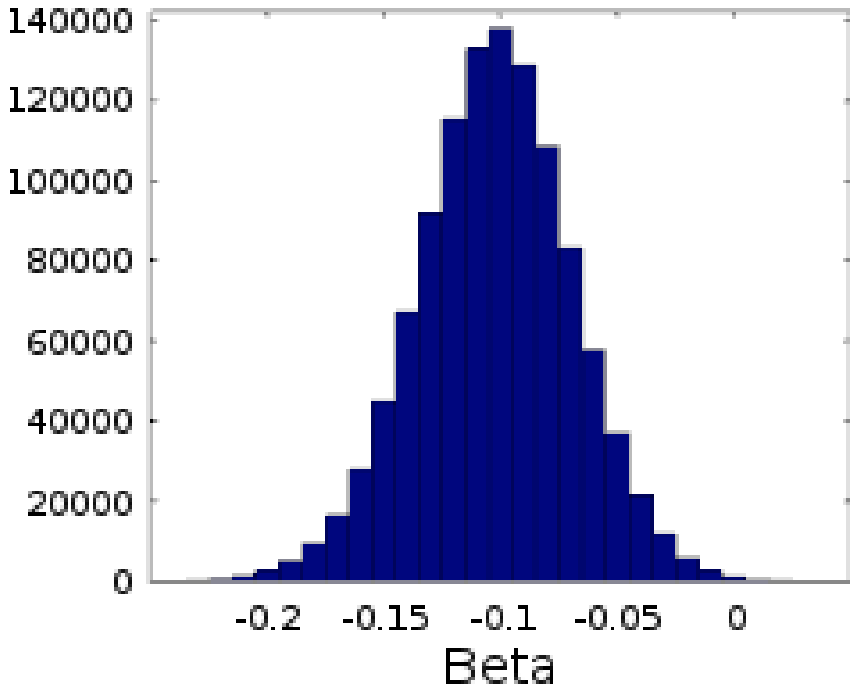
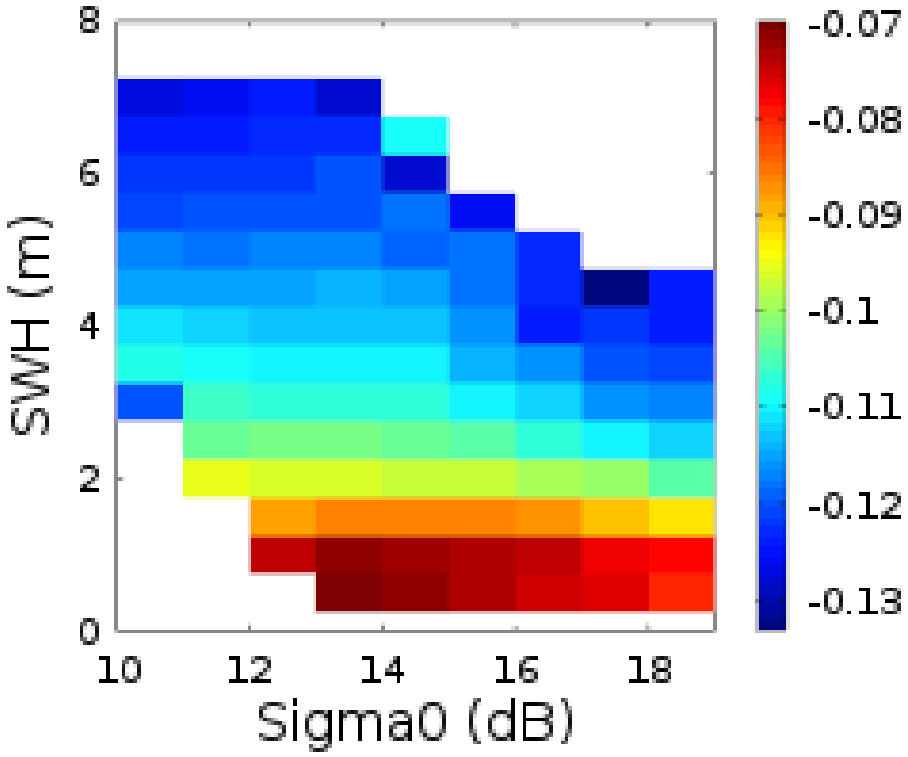
Histograms of regression slopes

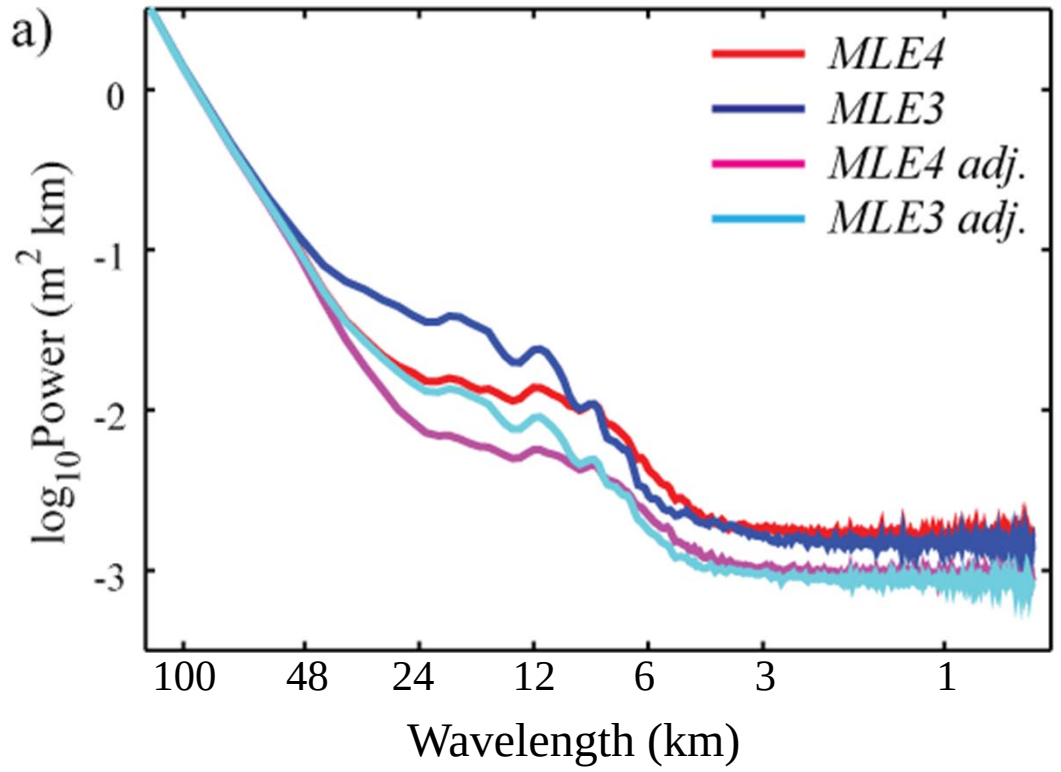
h , H_s



Variation with Conditions



Bigger magnitude at high H_s


a)
MLE4
MLE3
MLE4 adj.
MLE3 adj.
0
-1
-2
-3
log10Power (m2 km)
100
48
24
12
6
3
1
Wavelength (km)

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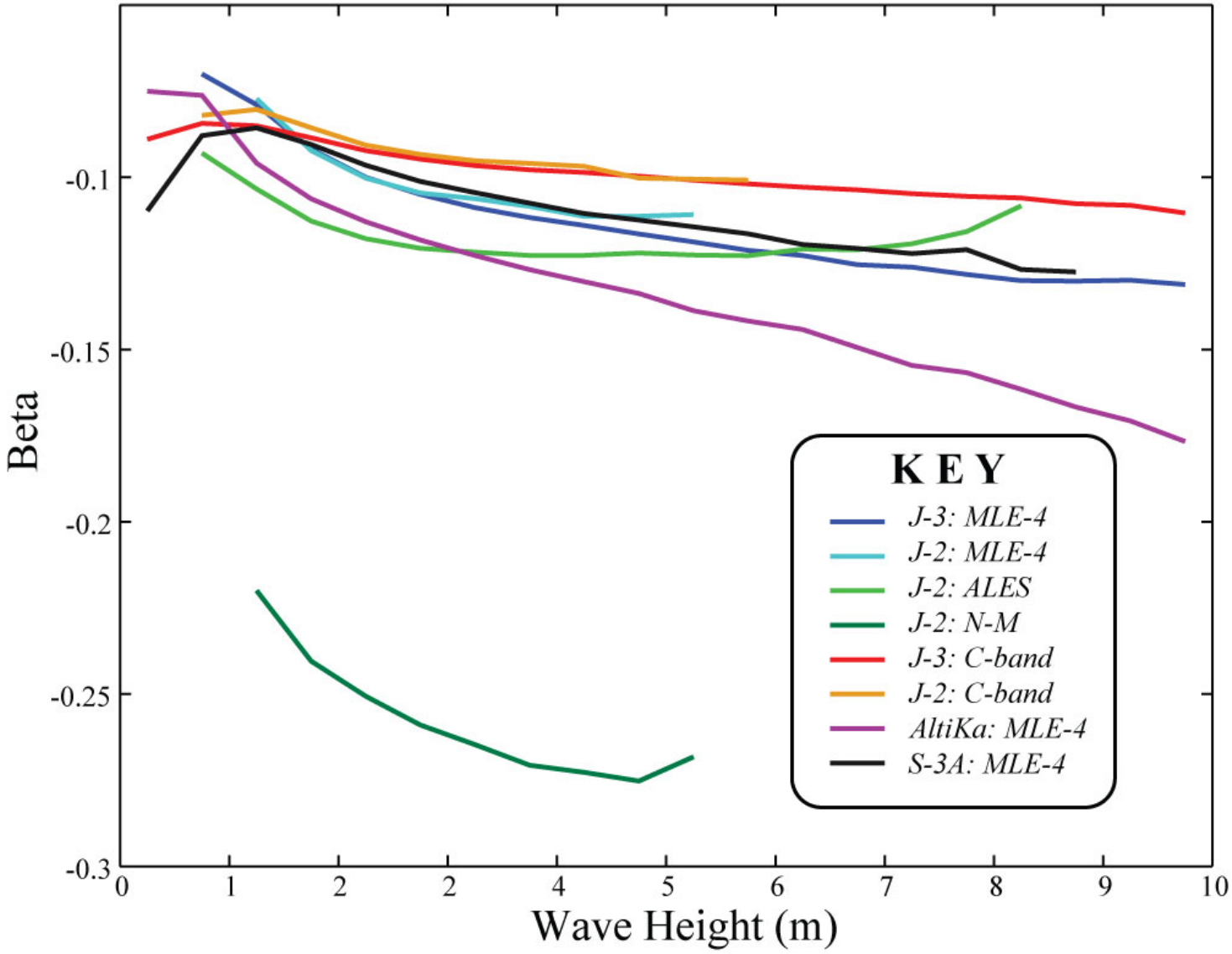
Altimeter/Tracker



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Altimeter/Tracker

Altimeter / Algorithm	Median α	% Variance explained	Resultant S.D. of σ^0_{adj}	Median β	% Variance explained	Resultant σ_h of h_{adj}
Jason-3/MLE-4	11.02	97%	0.060	-0.102	38%	0.068
Jason-3/MLE-3	-0.48	6.5%	0.059	-0.091	35%	0.065
Jason-2/MLE-4	11.01	97%	0.060	-0.101	38%	0.067
Jason-2/MLE-3	-0.48	6.5%	0.060	-0.091	35%	0.064
Jason-2/ALES				-0.117	50%	0.061
Jason-2/N-R				-0.102	19%	0.111
Jason-2/N-M				-0.252	28%	0.101
S-3A/PLRM	7.84	90%	0.070	-0.095	40%	0.084
S-3A/SARM				-0.095	[illegible]	0.052
Jason-3/C-band	-0.02	~0	0.141	-0.094	44%	0.137
Jason-2/C-band	-0.02	~0	0.140	-0.092	44%	0.135
AltiKa/MLE-4	8.51	4.2%	0.094	-0.116	43%	0.050

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— SSB & Ice —

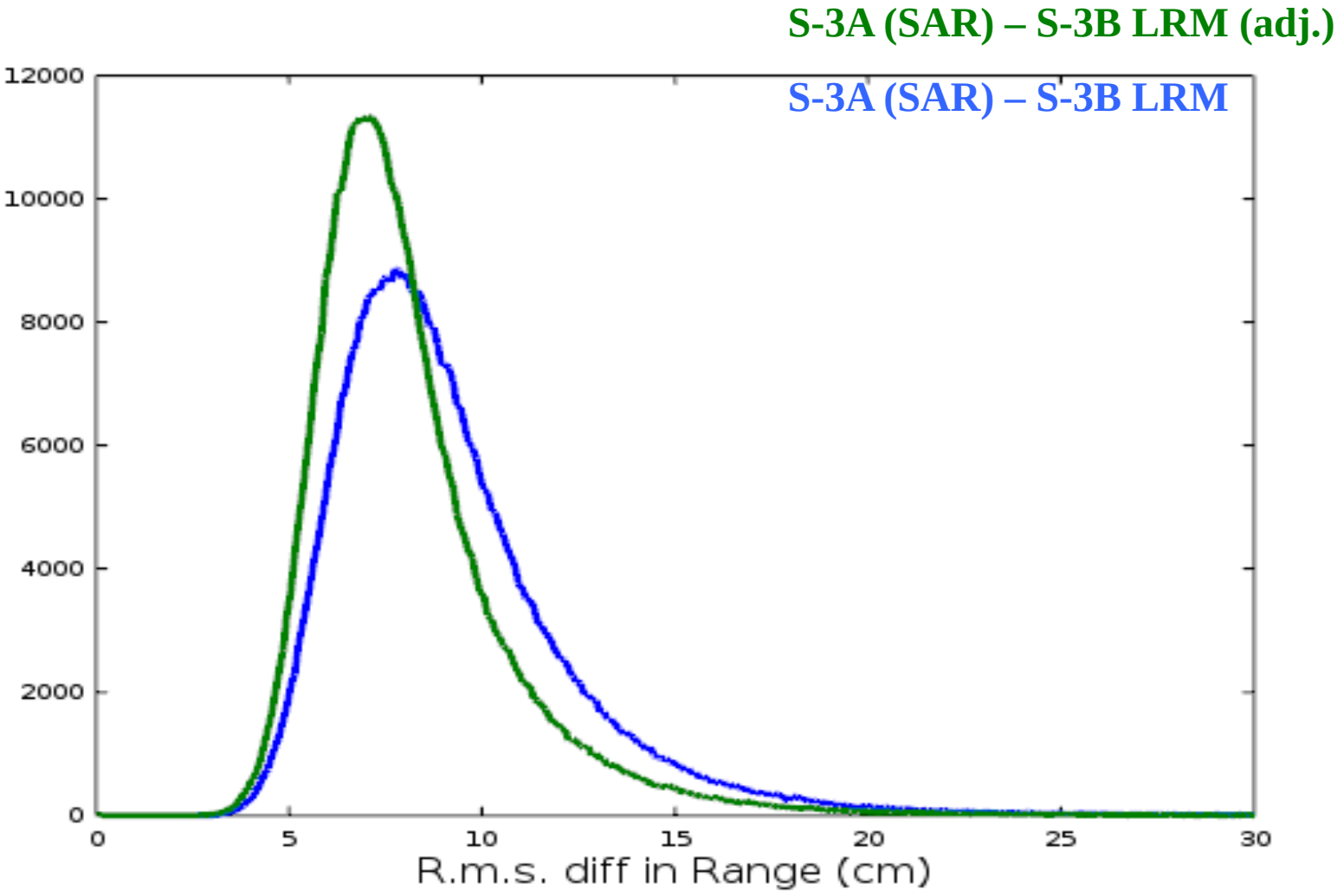
Hs-correlated noise

SSB = EM bias + Skewness bias + Retracker bias

Similar empirical corrections in ice studies

Correcting range for changes in LEW

S-3B – S-3A tandem



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Summary

Covariant errors between σ^0 and ψ^2 well understood;

similar, but weaker effect for h, H_s

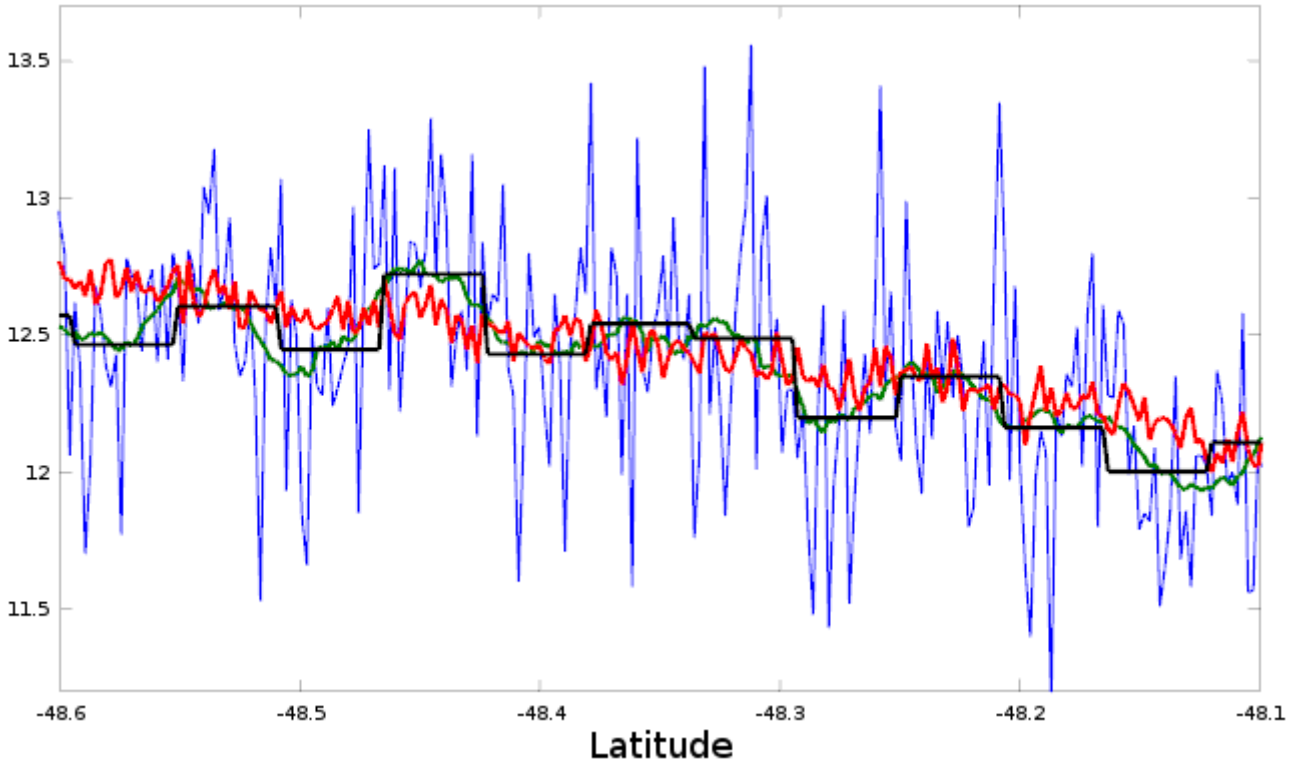
Derived by looking at highest frequency variability

Zaron & de Carvalho had similar results from RTA

Easier investigation of variation with H_s, σ^0 etc.

Can work with long-repeat or no-repeat missions

EXTRAS



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