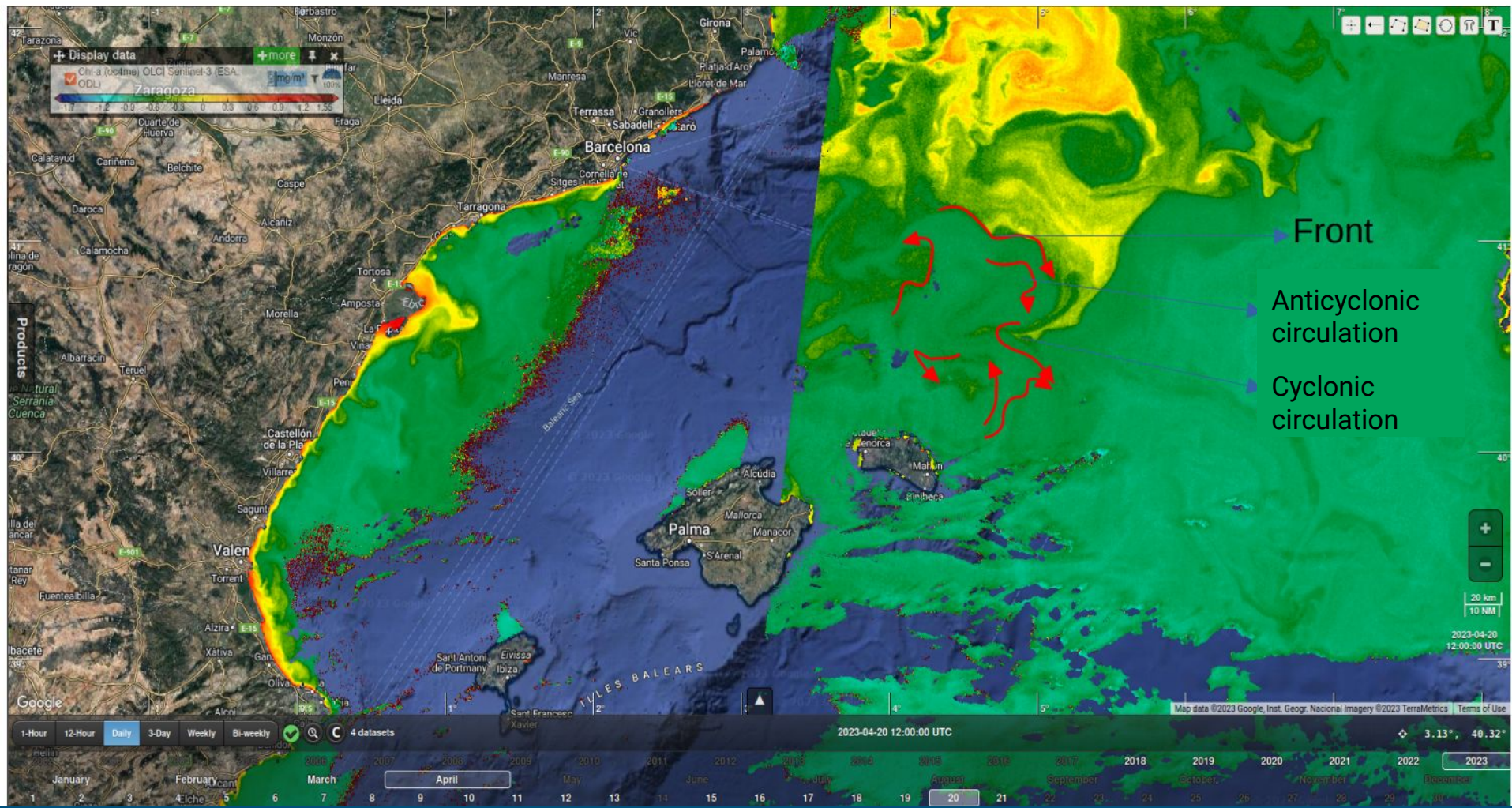


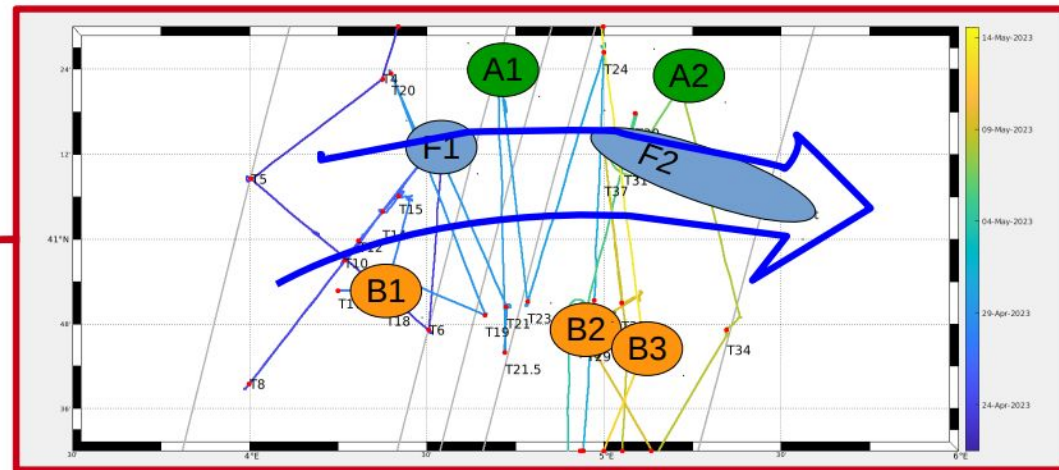
BIOSWOT Vertical Velocity Profiler (VVP)

—
STAGE HARRY MIO

H. Boutemy, E. Lefevre, S. Barrillon, J.L. Fuda

BIOSWOT-Med





DATA

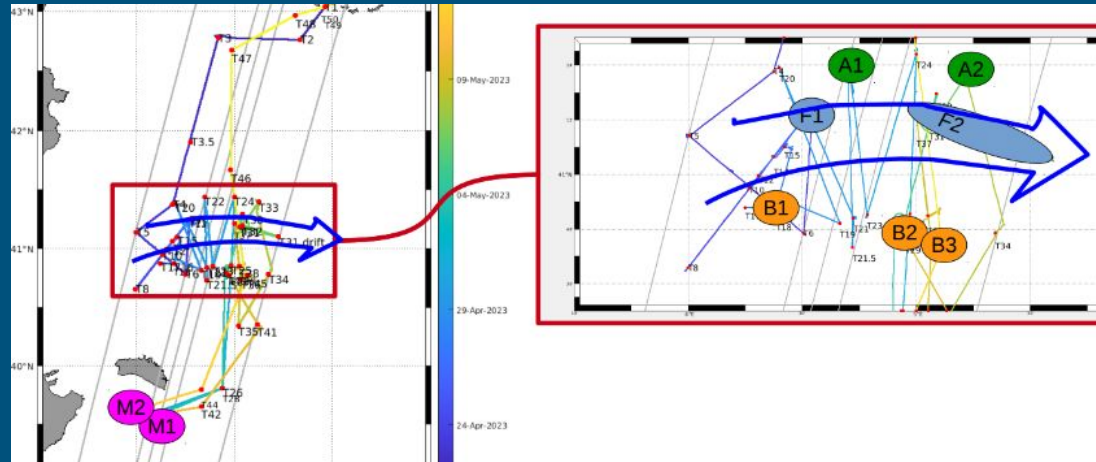
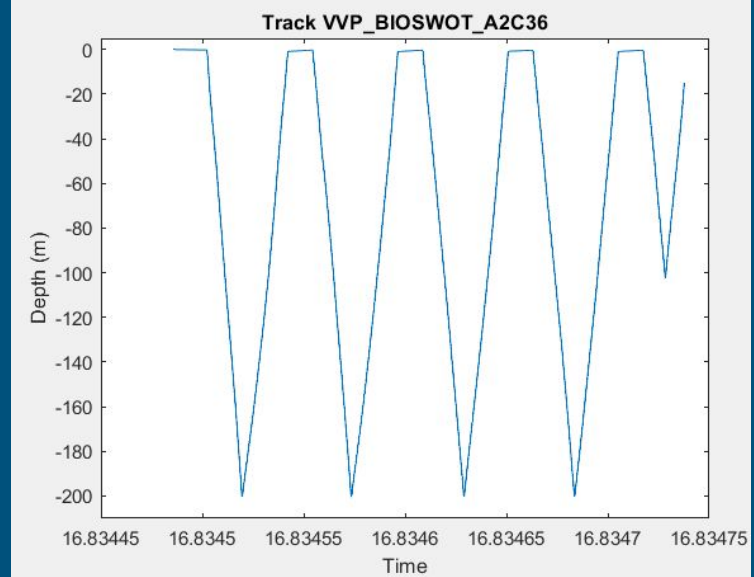
11 Stations: 1 zone A
5 zone B
5 zone M

4-6 Profiles per station

Depth 200m

Time ~6h

Descent speed ~10cm/s



MODELE DE VOL

Hypothesis: all vertical velocities average to zero

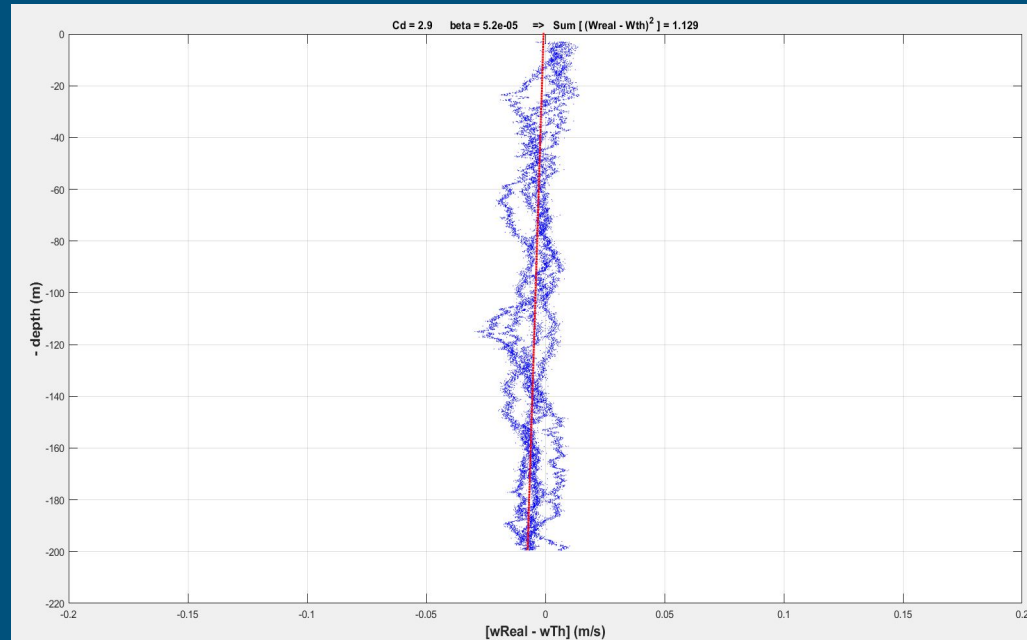
VVPprocessBIOSWOT.mat
Jean-Luc Fuda

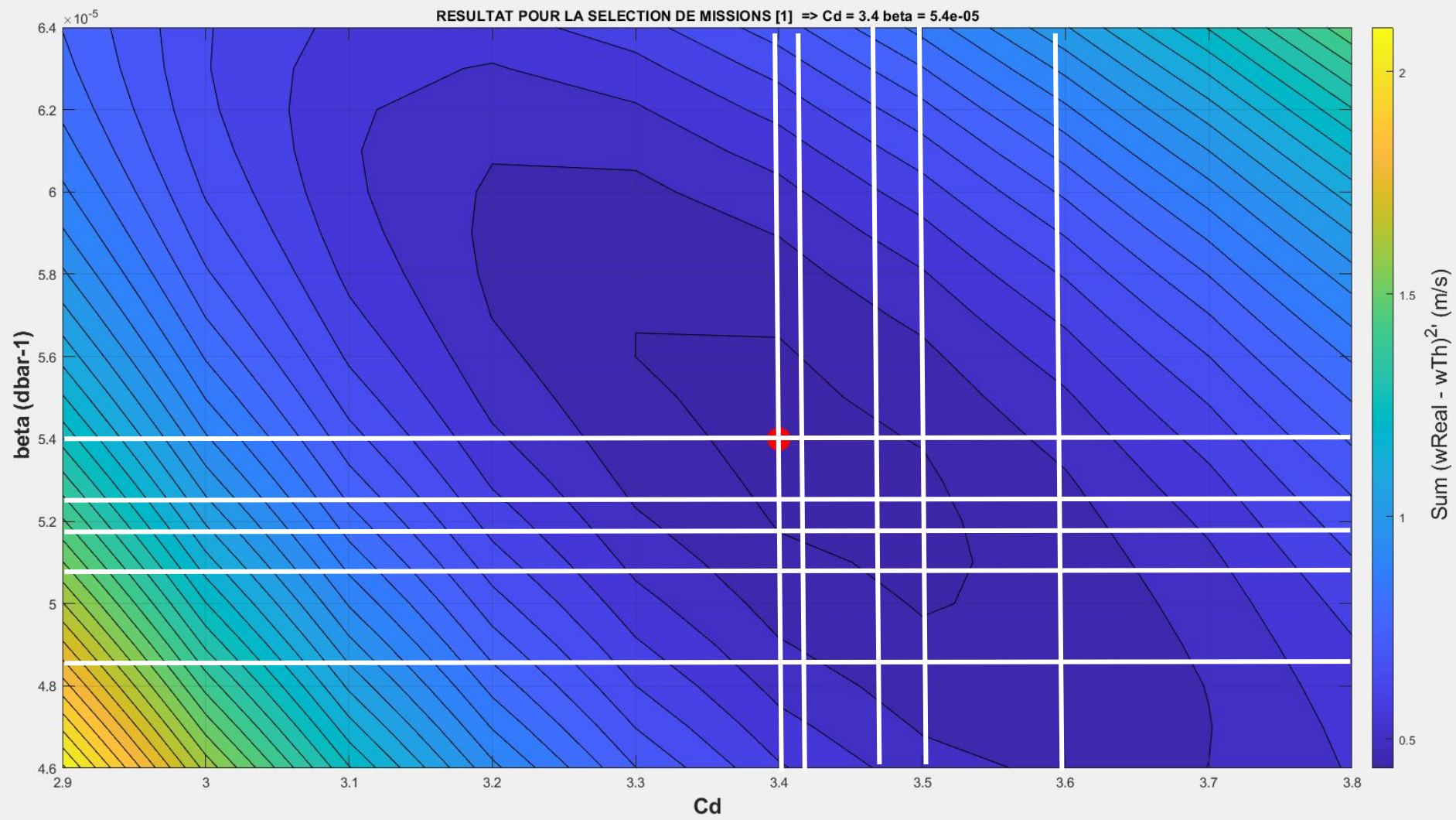
$w_{\text{Model}}(C_d, \beta)$

C_d : coefficient de trainée

β : coefficient de compressibilité

$w_{\text{Oc}} = w_{\text{Real}} - w_{\text{Model}}$

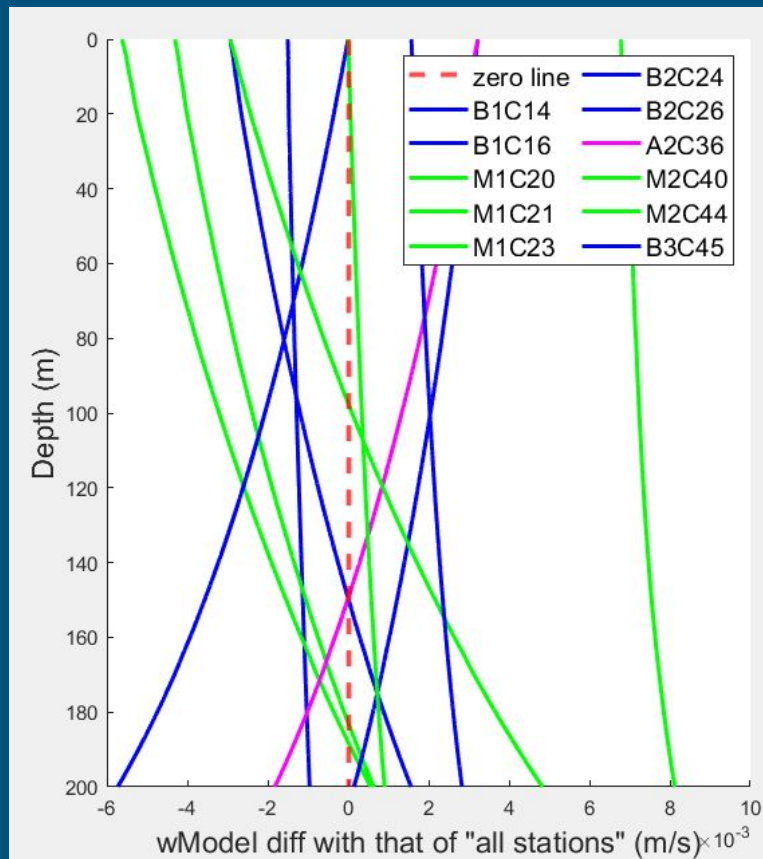
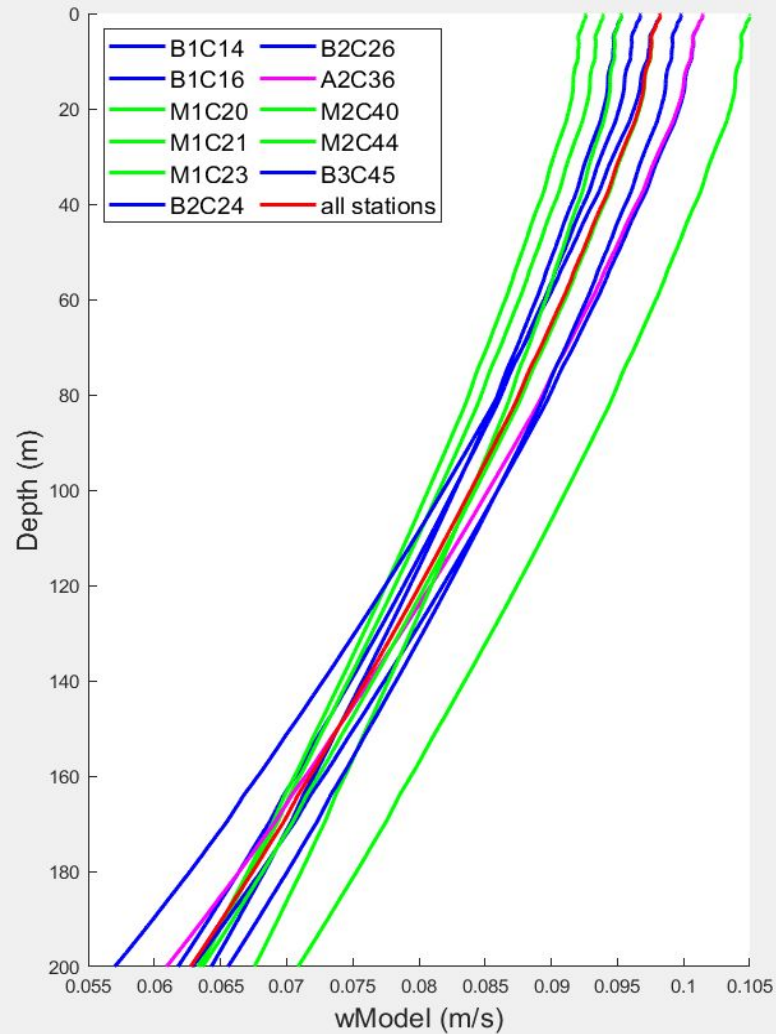




MODELE DE VOL

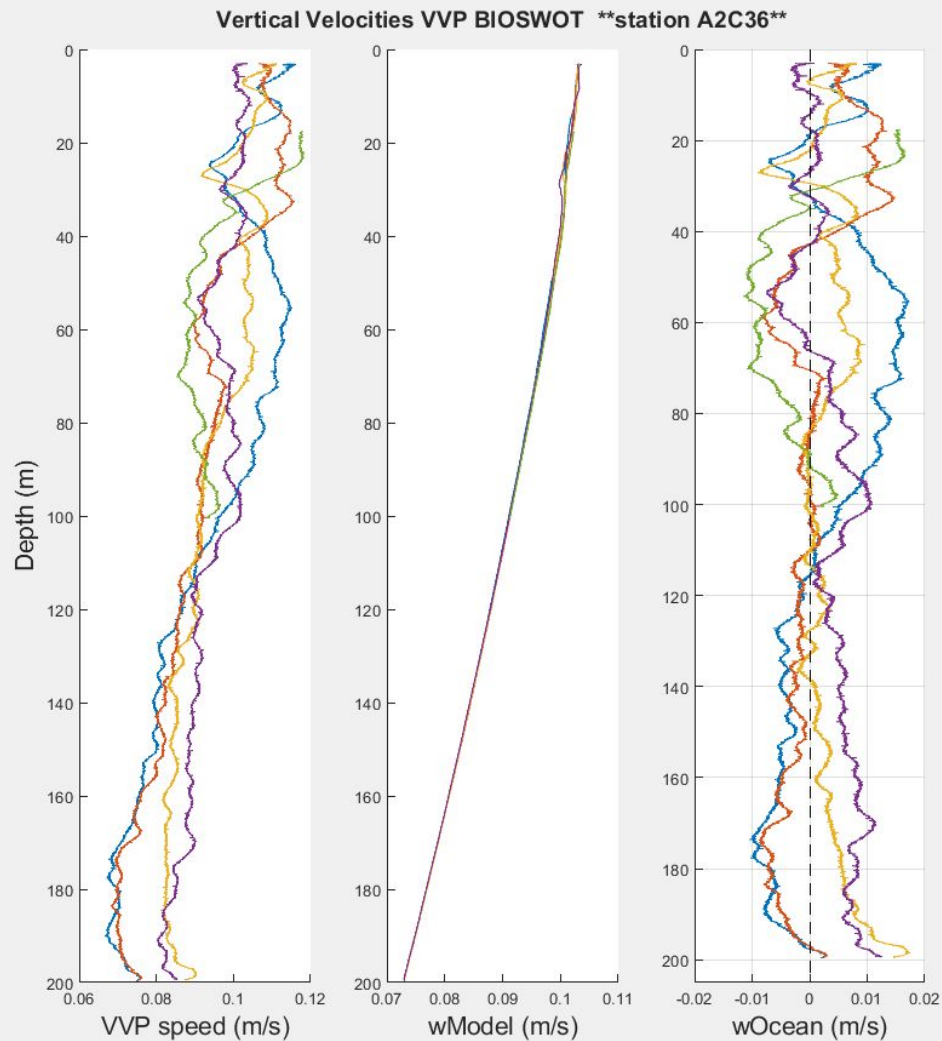
	VVPprocess	Optimized
Resolution:	0.1	0.01
Runtime:	~5 seconds	~15 seconds
	runtime x4 if resolution doubled	runtime x2 if resolution doubled
	runtime x100 if resolution x10 (same resolution as Optimized)	

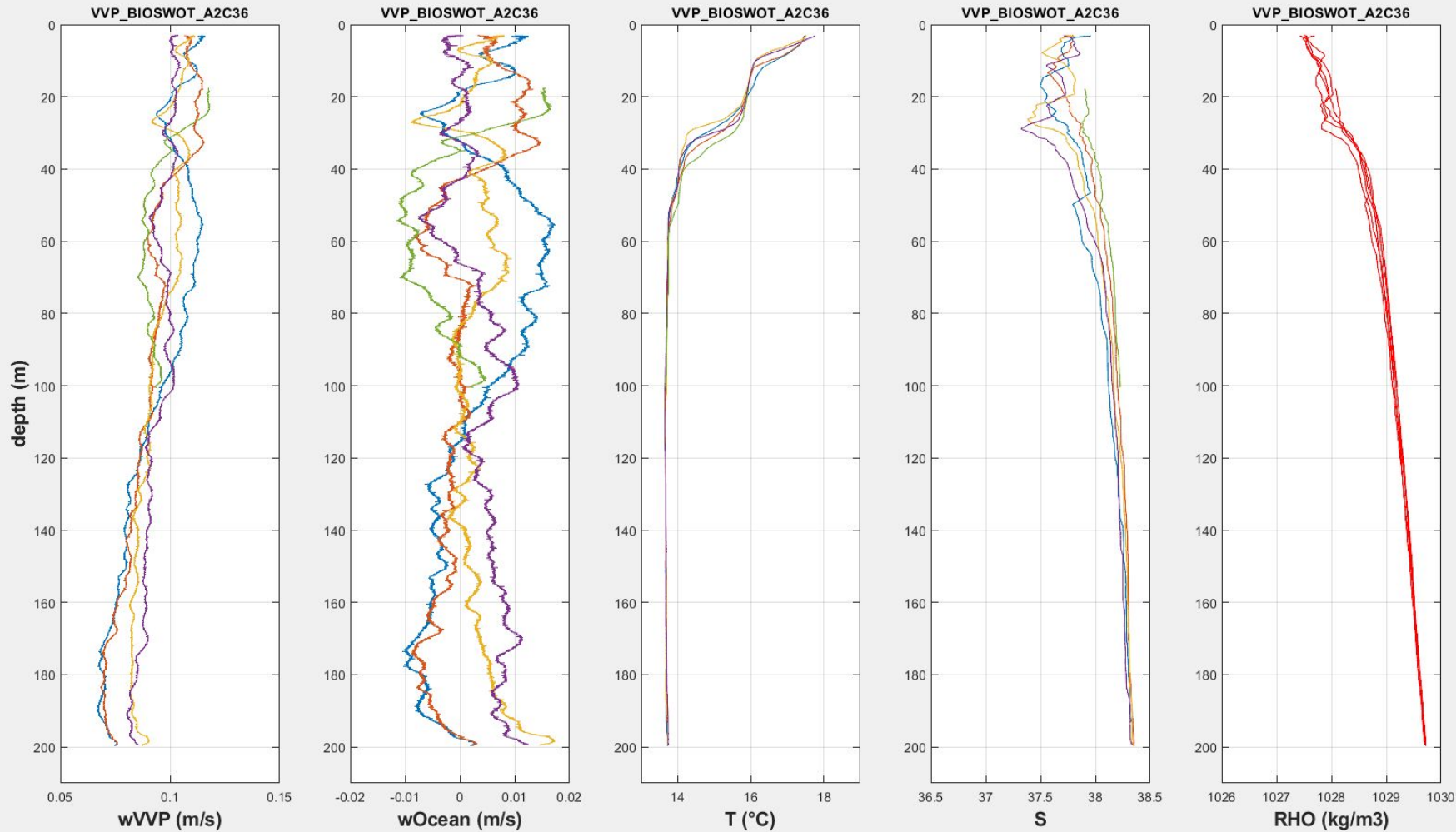
FLIGHT MODEL SENSIBILITY



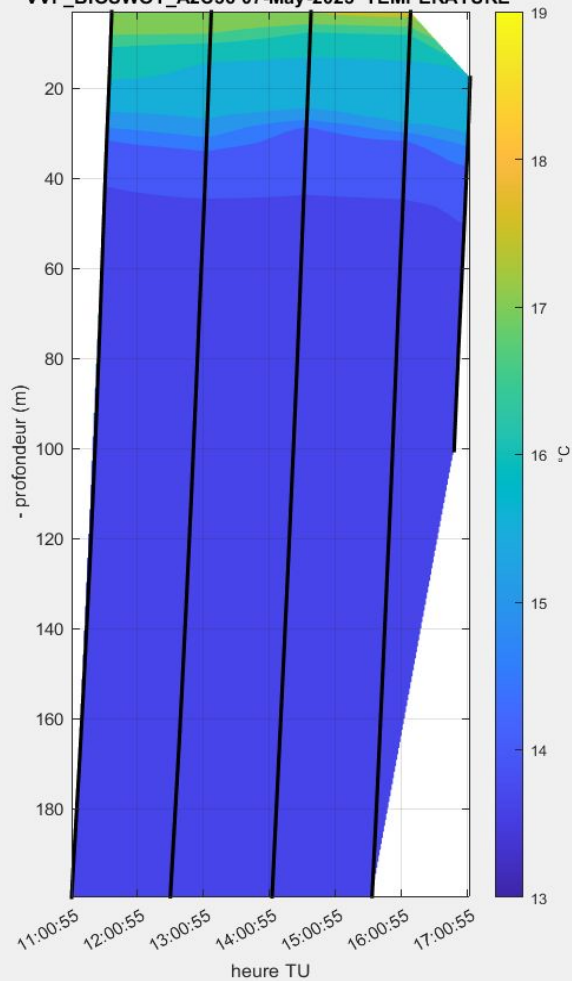
VITESSES VERTICALES

$$w_{\text{Ocean}} = w_{\text{Real}} - w_{\text{Model}}$$

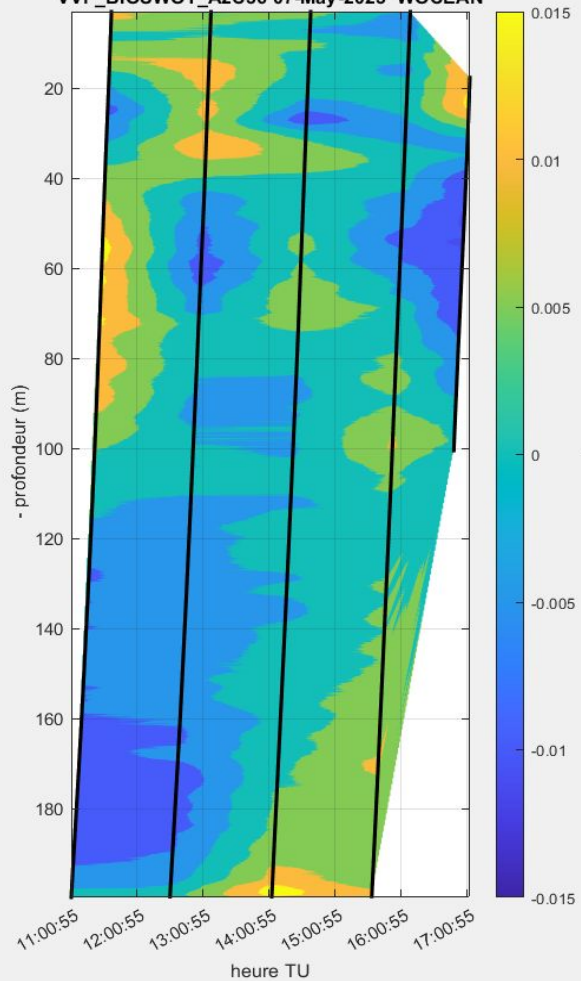




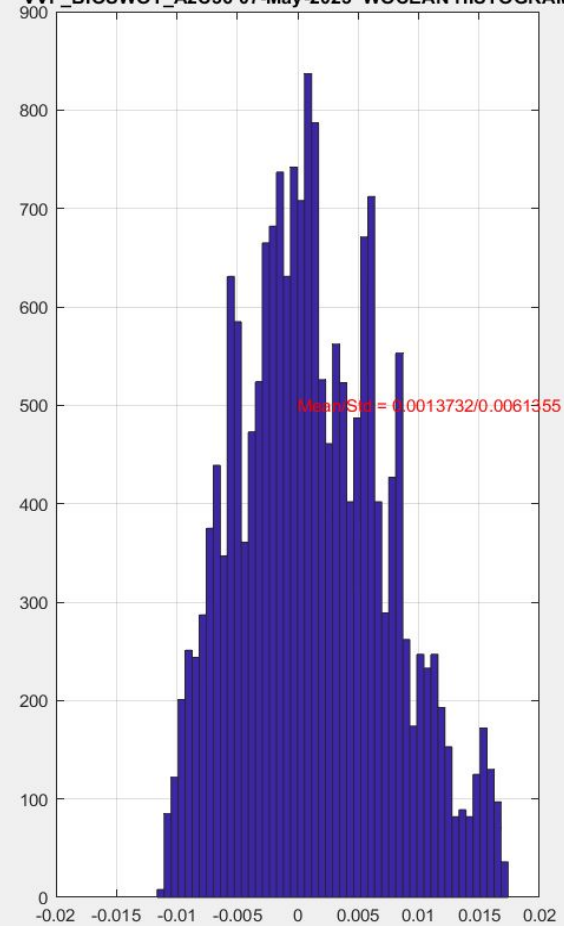
VVP_BIOSWOT_A2C36 07-May-2023 TEMPERATURE



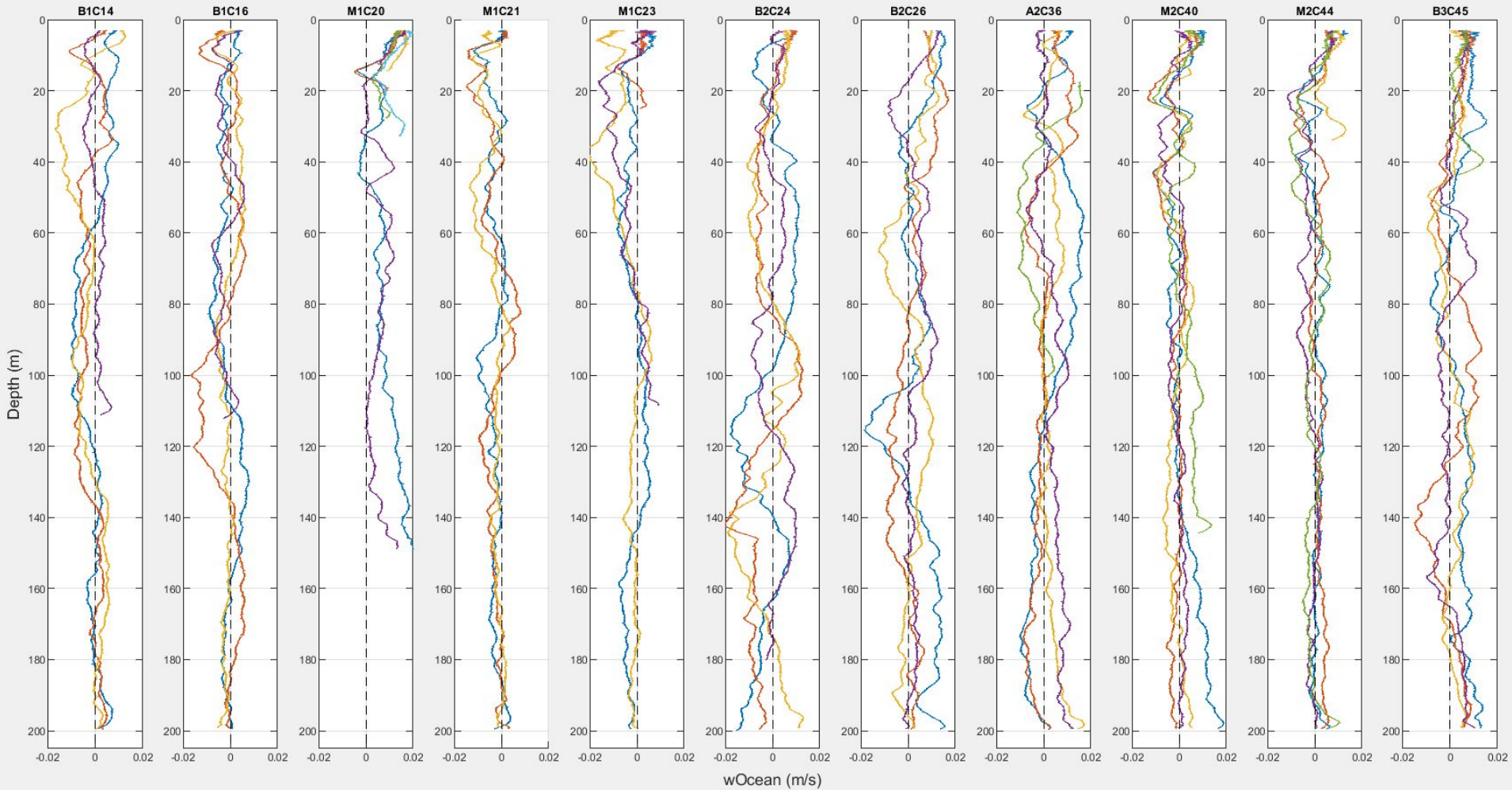
VVP_BIOSWOT_A2C36 07-May-2023 WOCEAN



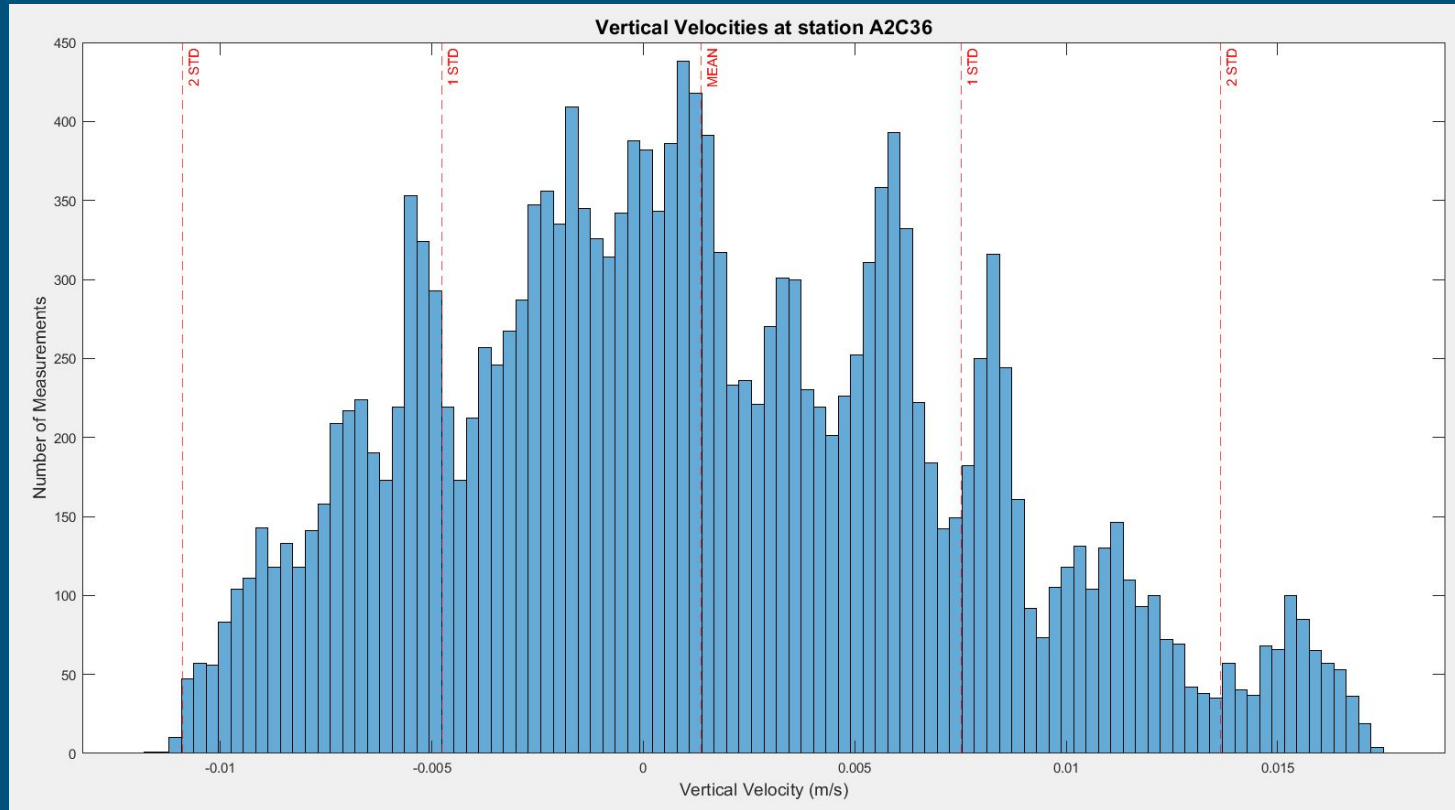
VVP_BIOSWOT_A2C36 07-May-2023 WOCEAN HISTOGRAM



Vertical Velocities VVP BIOSWOT

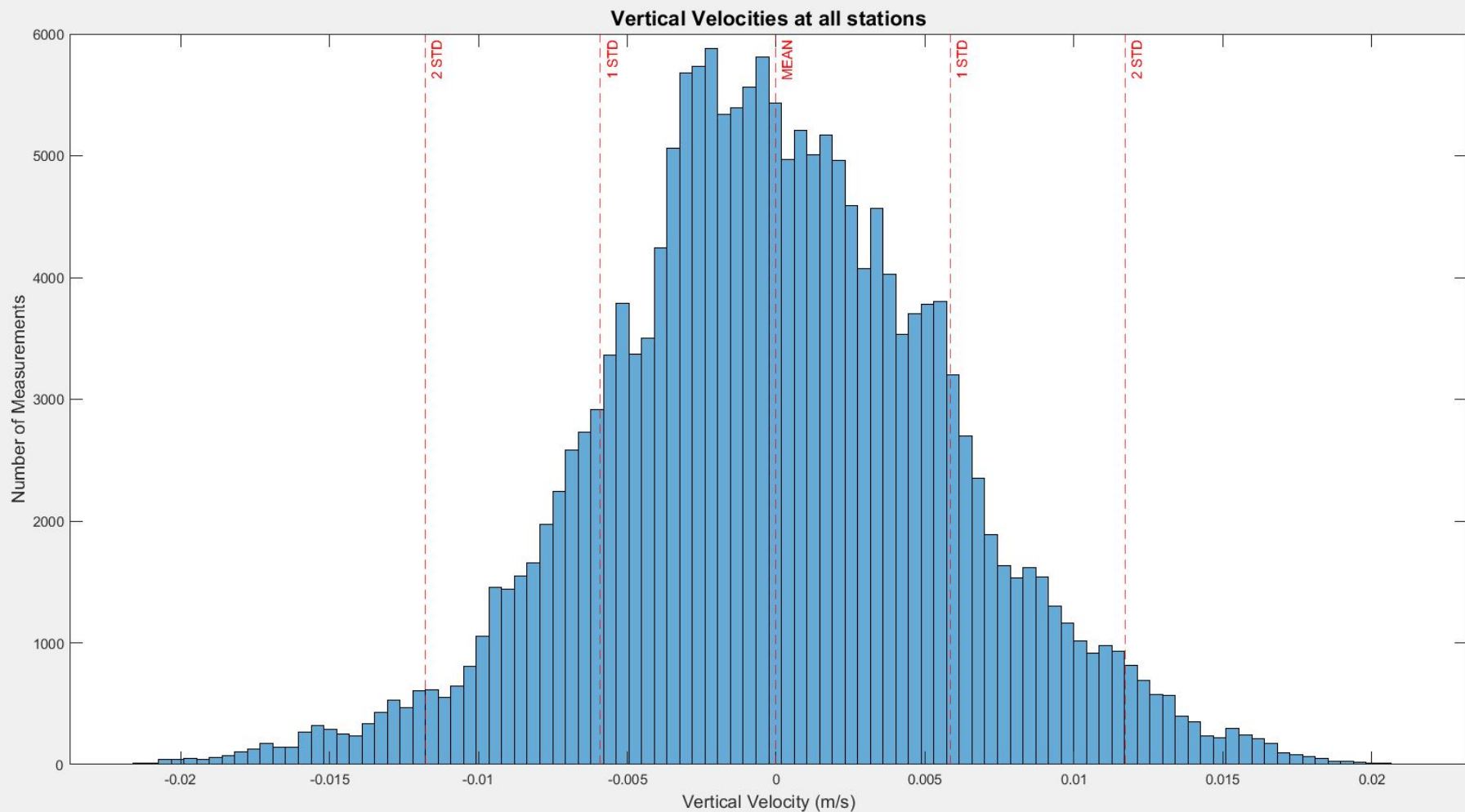


DISTRIBUTION



Mean: 0.0014 m/s

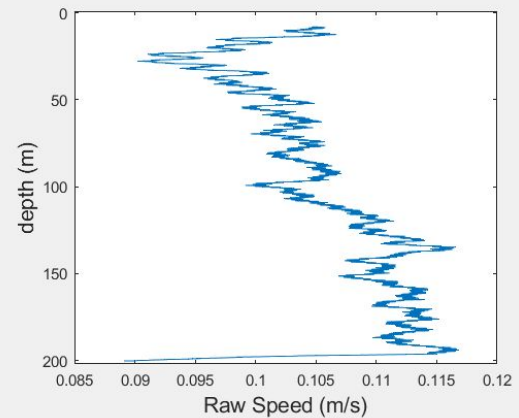
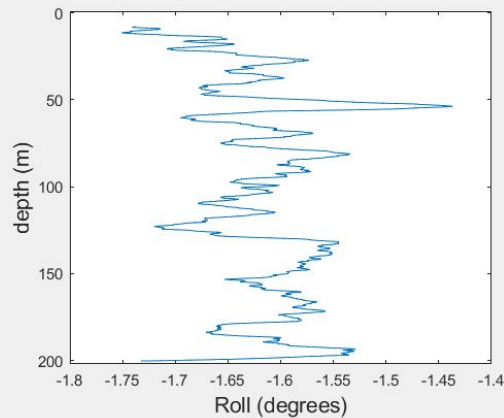
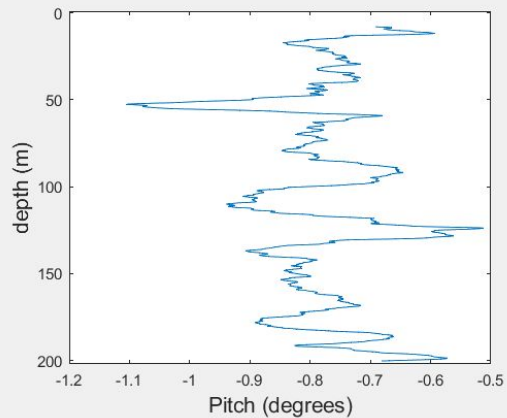
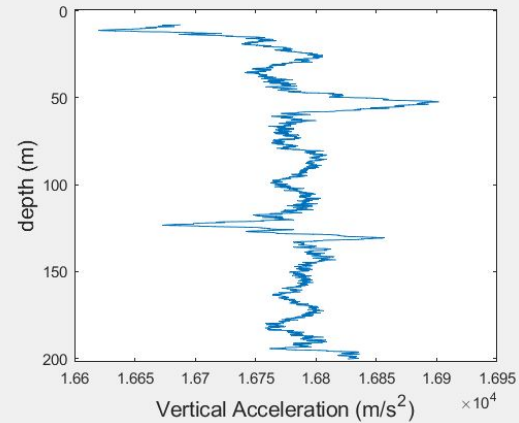
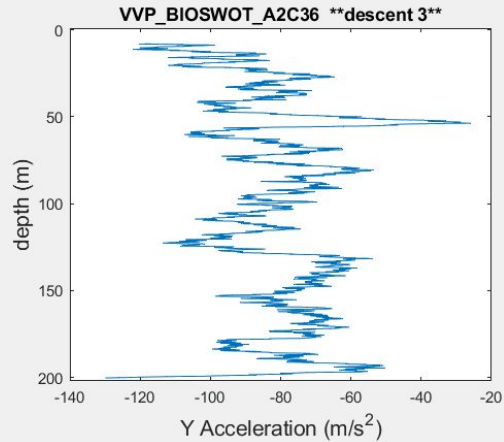
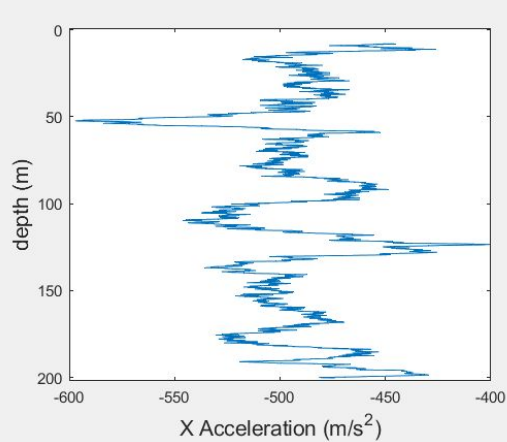
Std: 0.0061



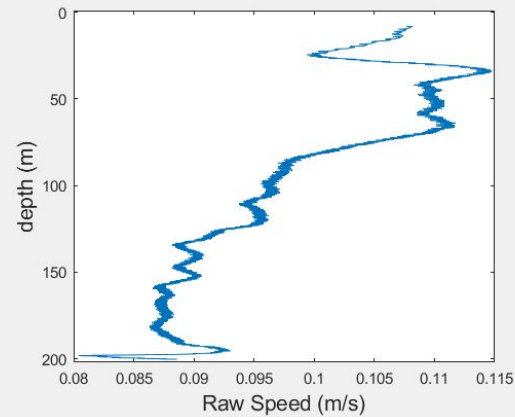
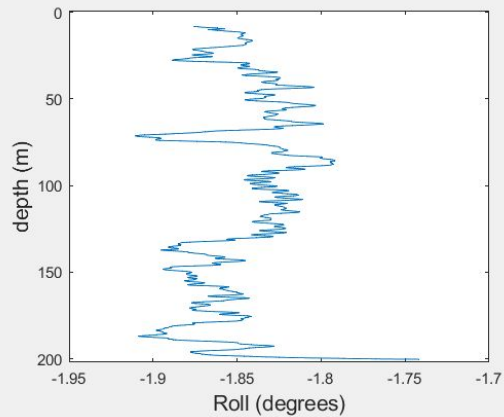
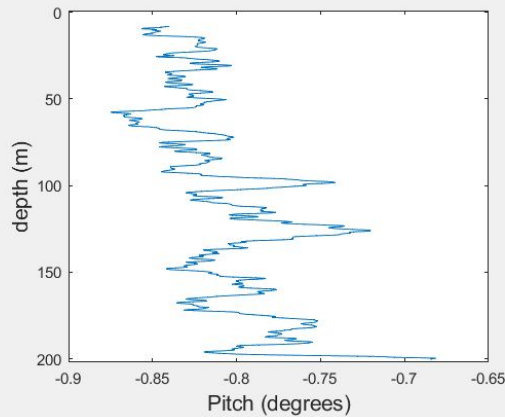
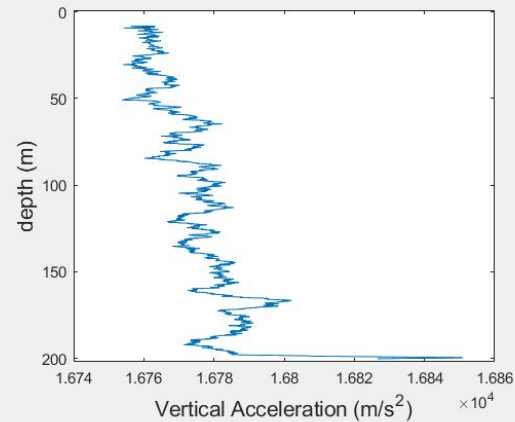
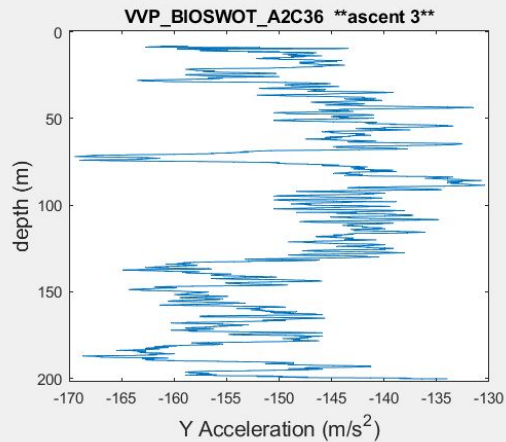
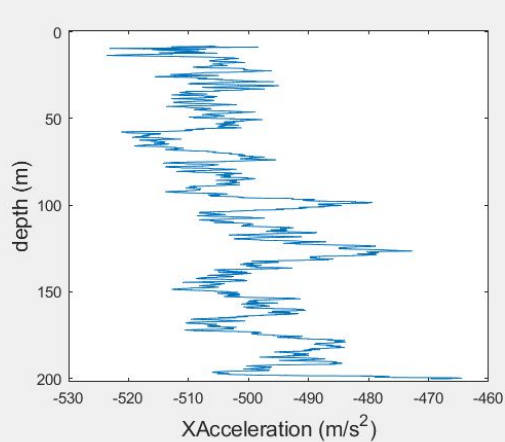
Mean: -2.5×10^{-5} m/s

Std: 0.0059

VVP MOTION



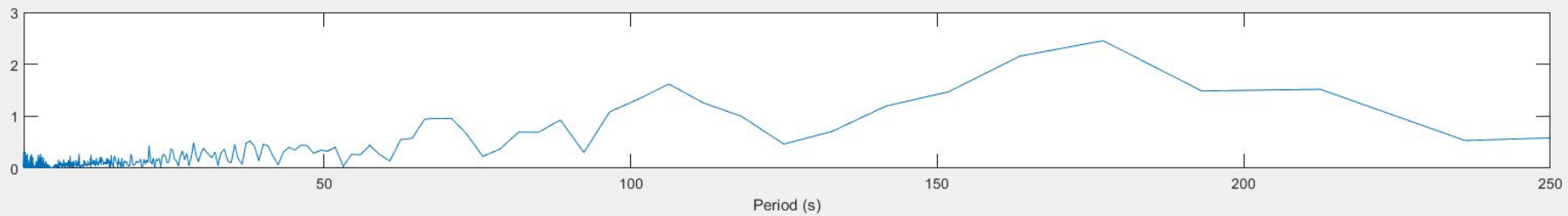
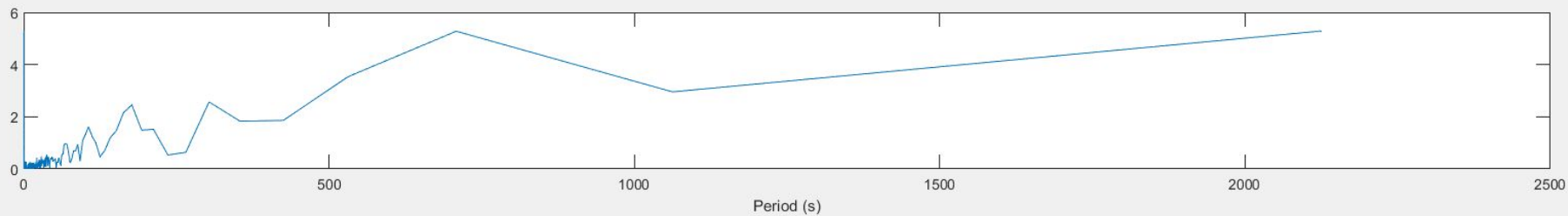
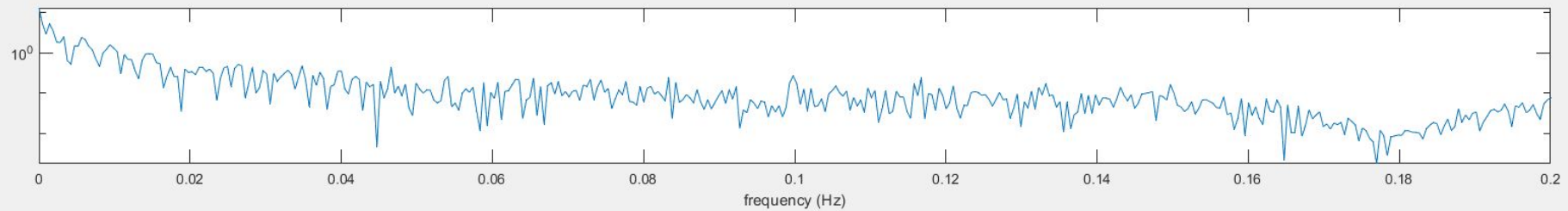
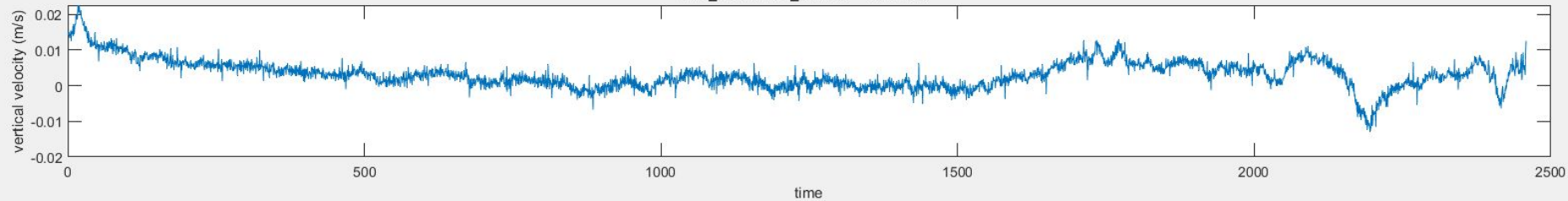
VVP MOTION

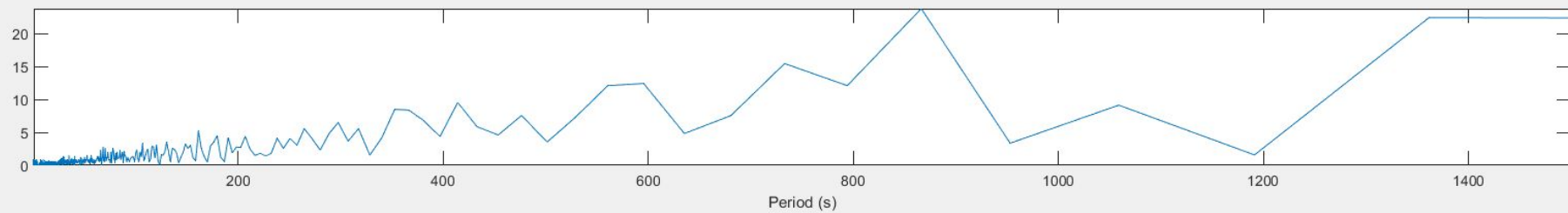
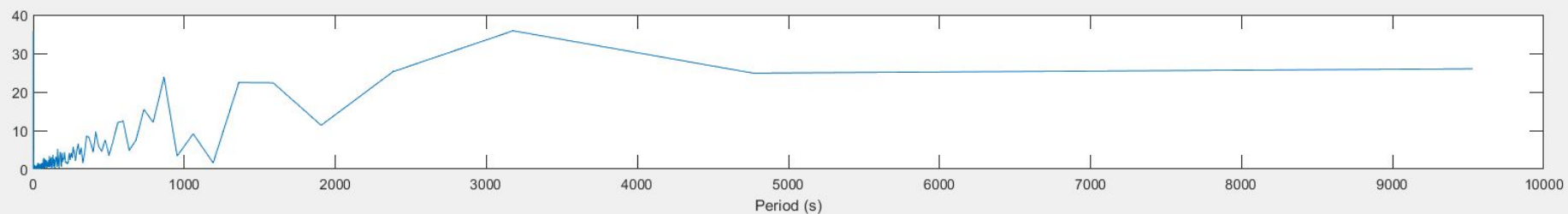
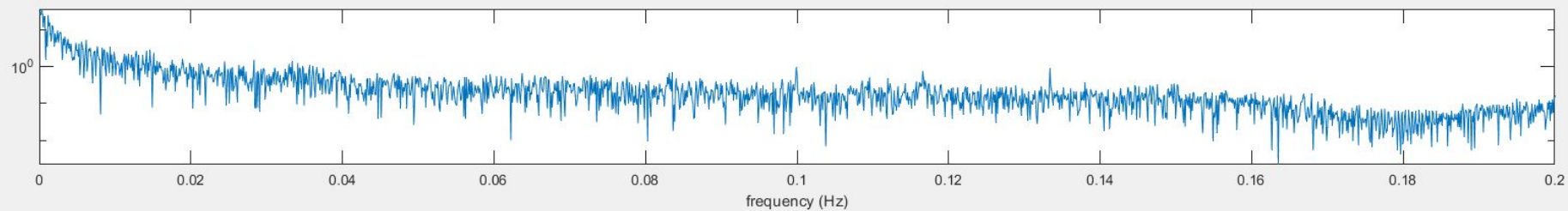
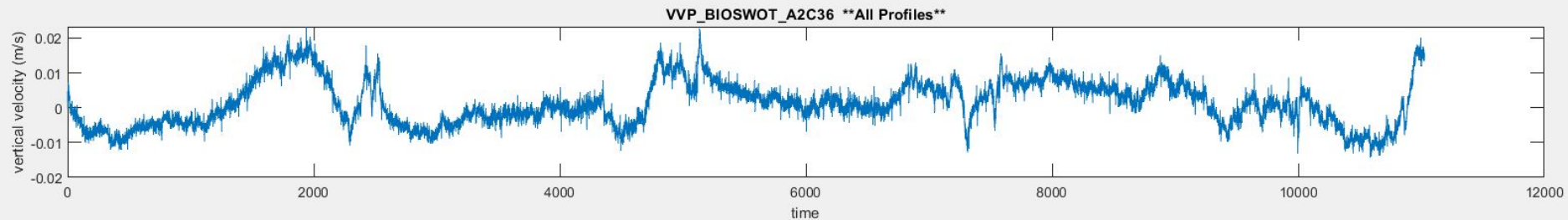




ANALYSE PAR TRANSFORMEE DE FOURIER

VVP_BIOSWOT_A2C36 **Profile 3**





VVP & FF-ADCP

Common profiles:

Station 14 profil 3

Station 16 profil 4

Station 21 profil 3

Station 26 profil 4

Station 36 profils 3, 4

Station 40 profils 3,4

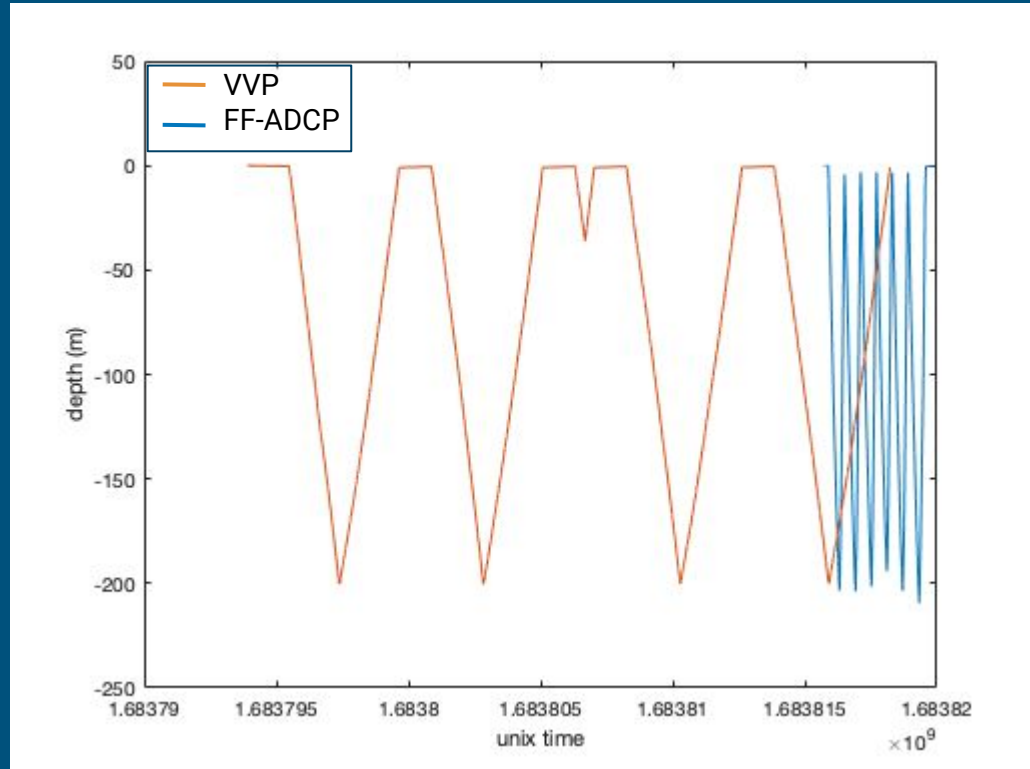
Station 44 profil 4

Station 45 profils 3,4

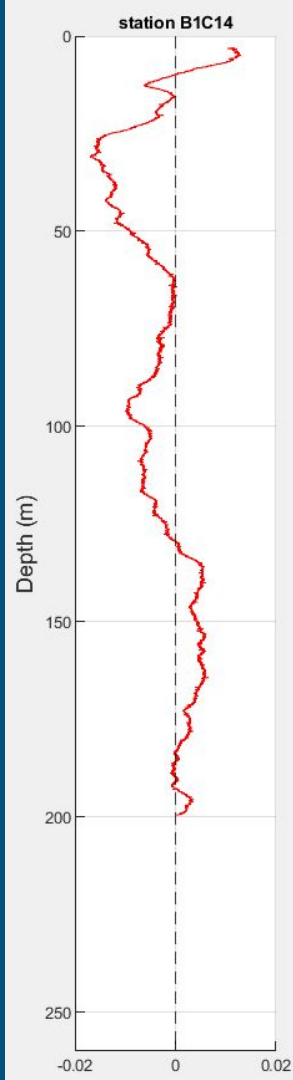
Track VVP and FF-ADCP to find common profiles

Same time

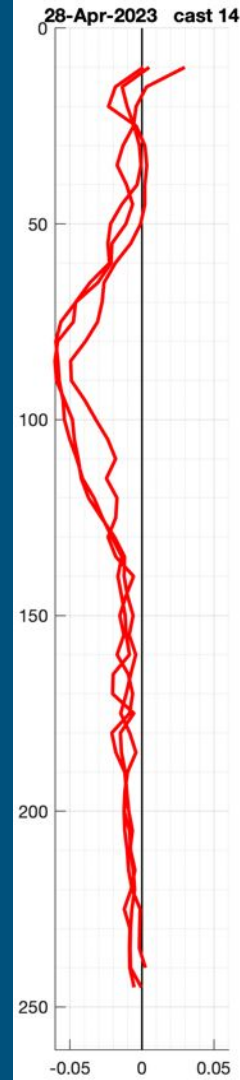
Few 100m away from each other



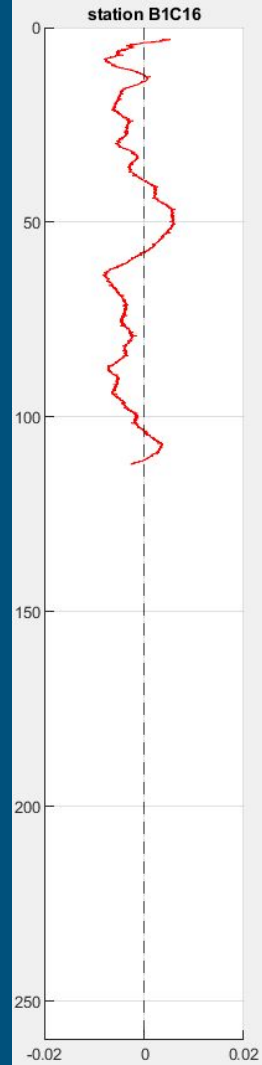
VVP



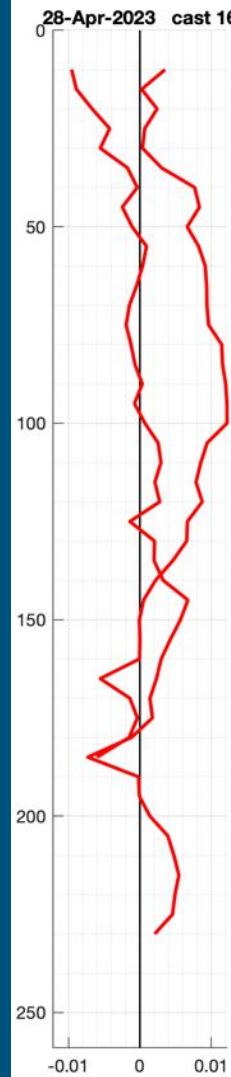
FF-ADCP



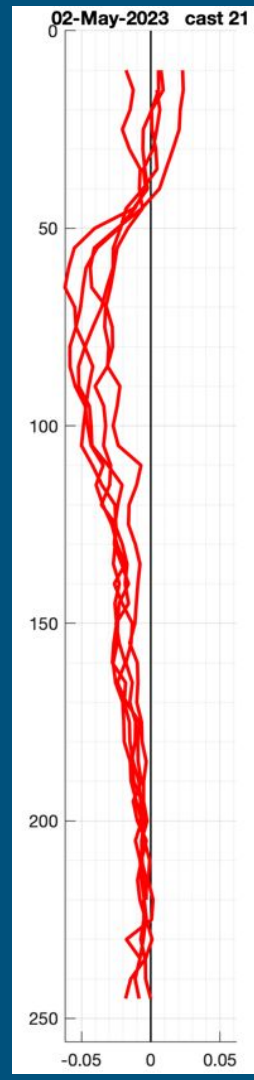
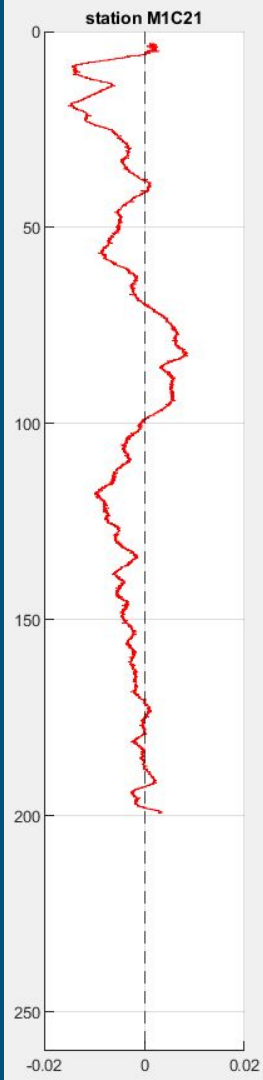
VVP



FF-ADCP

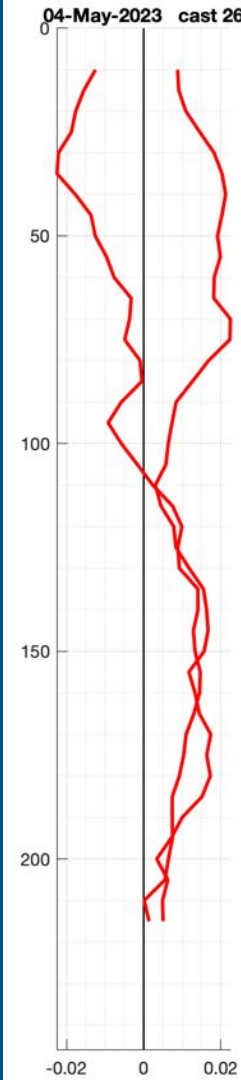
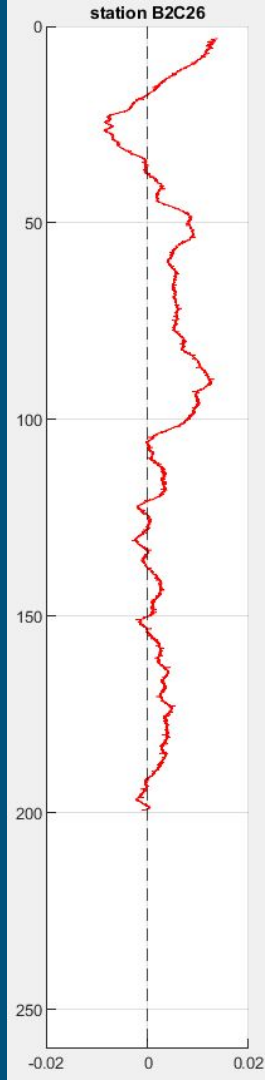


VVP



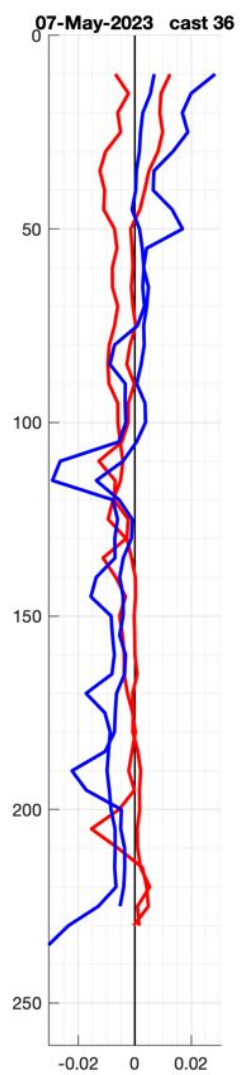
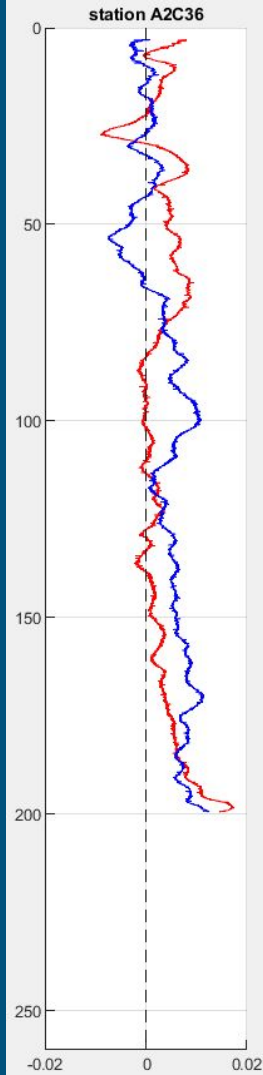
FF-ADCP

VVP



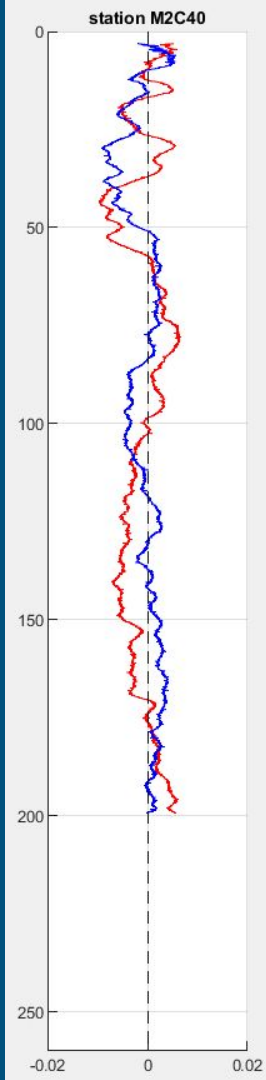
FF-ADCP

VVP

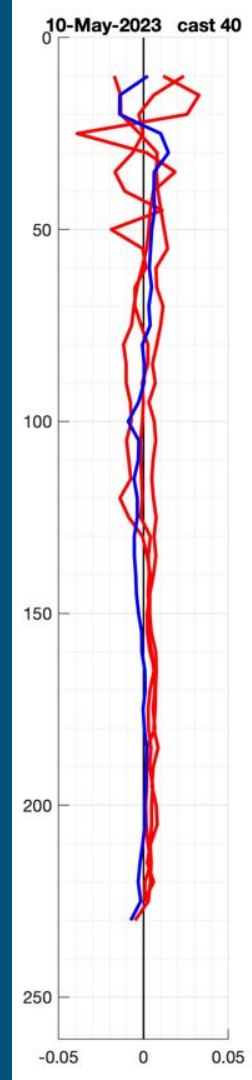


FF-ADCP

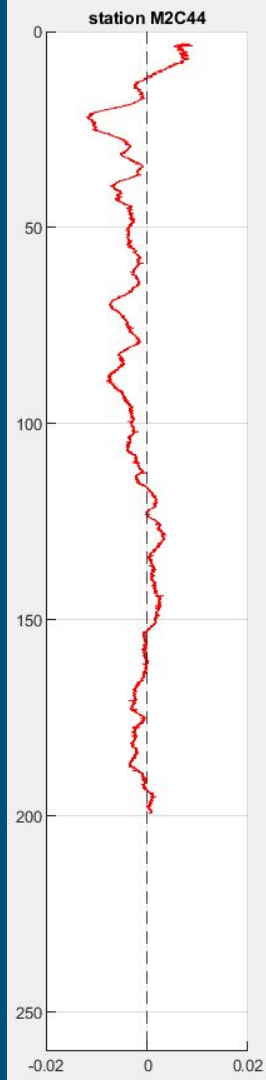
VVP



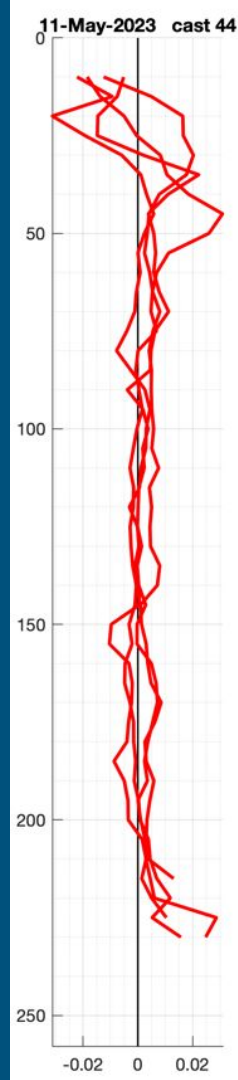
FF-ADCP



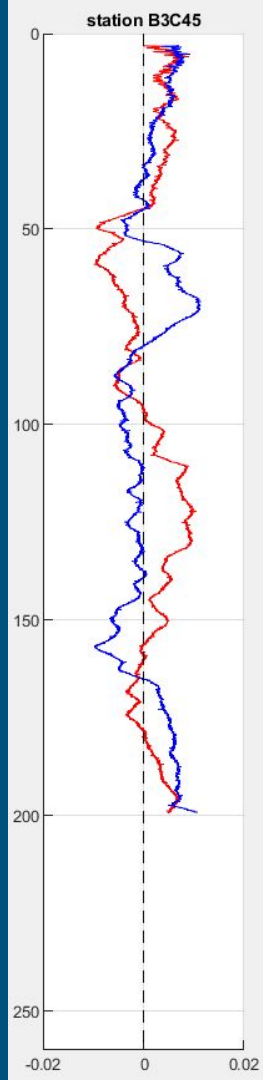
VVP



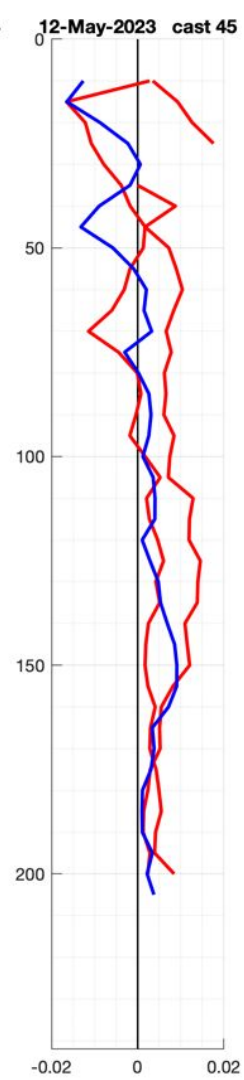
FF-ADCP



VVP



FF-ADCP



SUMMARY

Modele de vol:

- Optimisation algo recherche Cd, beta
- Sensibilité

Analyse des profils:

- Vitesses verticales
- Distribution
- VVP Motion
- Fourier

Mission JULIO

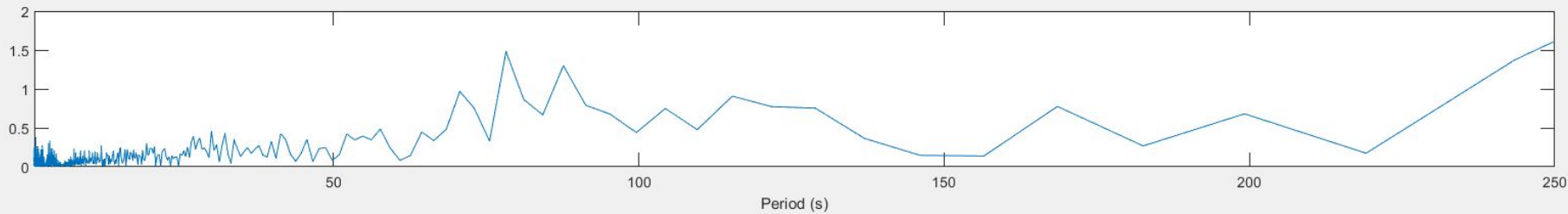
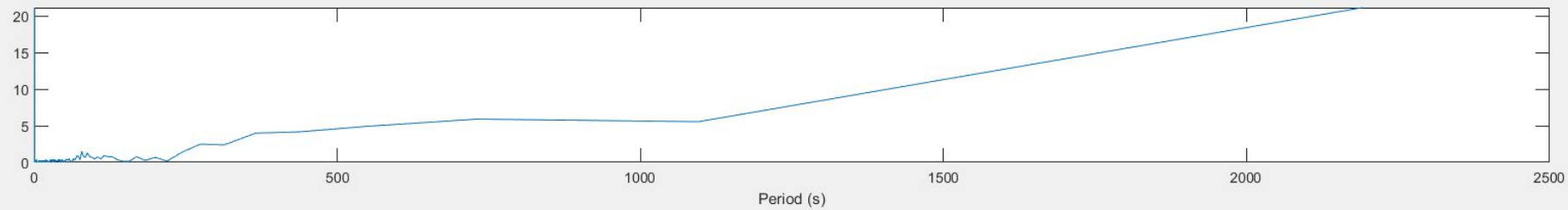
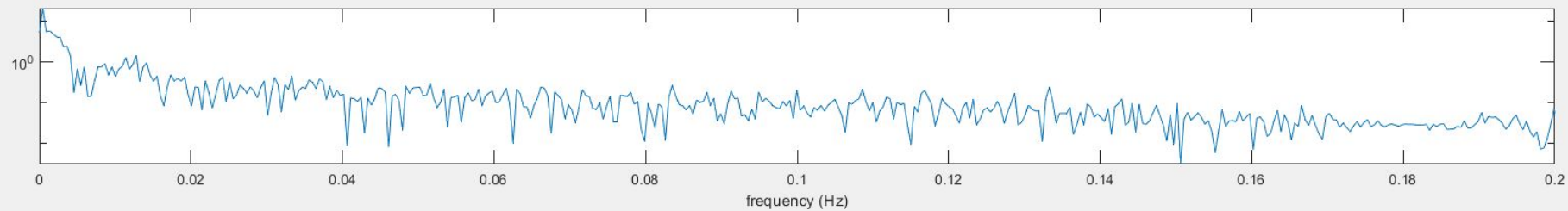
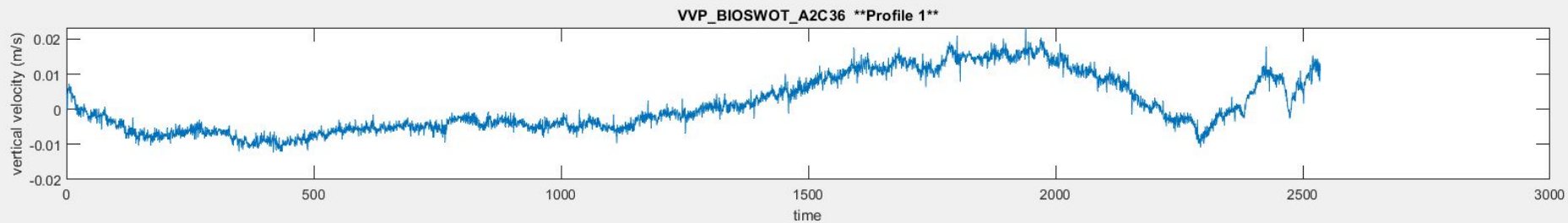
Next steps:

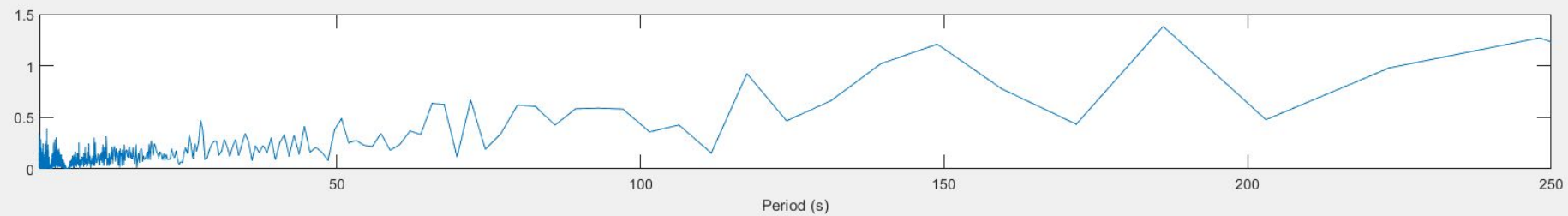
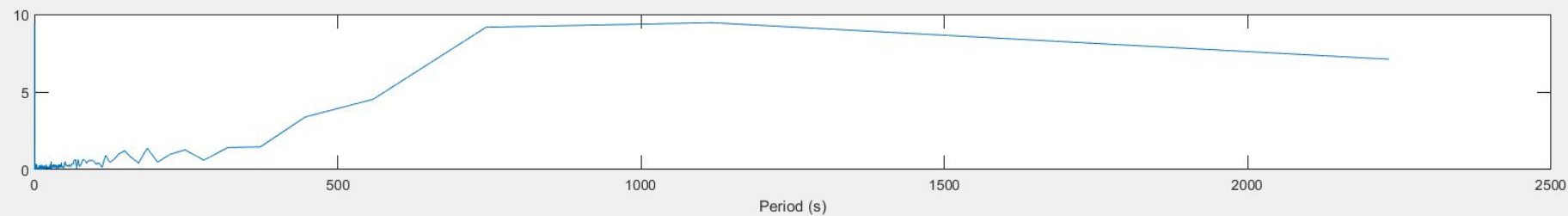
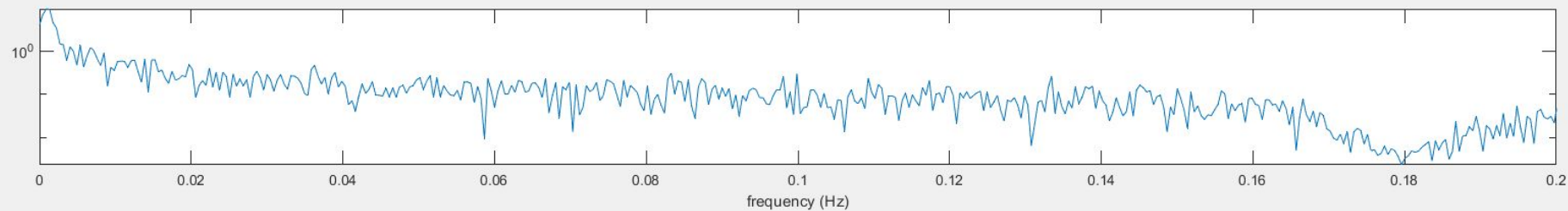
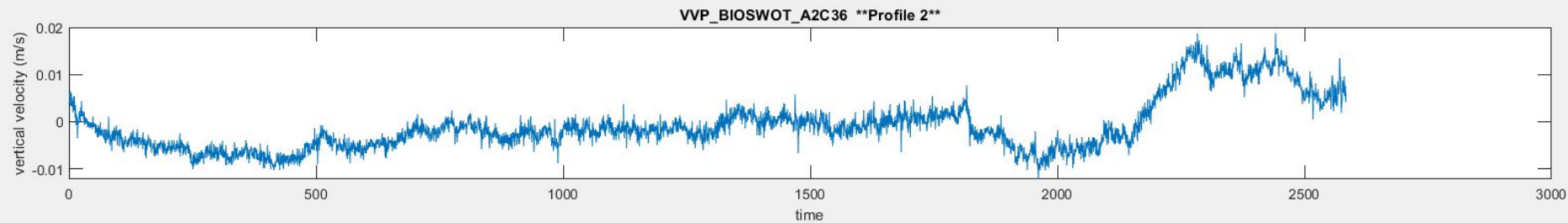
- Better algorithm
- Modele de vol JULIO for mass sensibility
- Better analyse and understand fourier
- Compare fourier with FF-ADCP

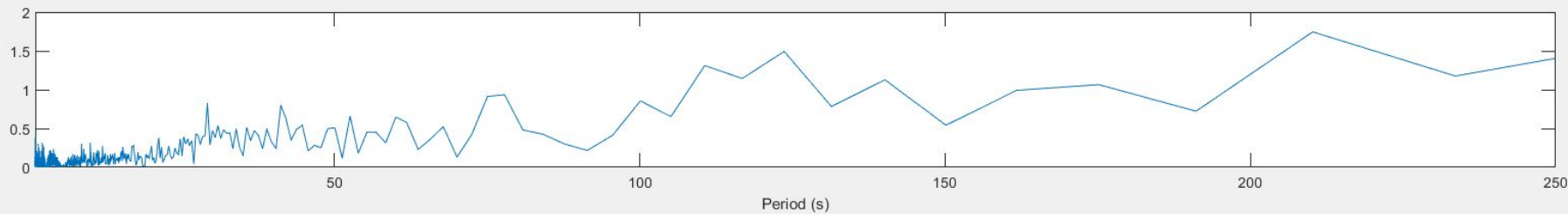
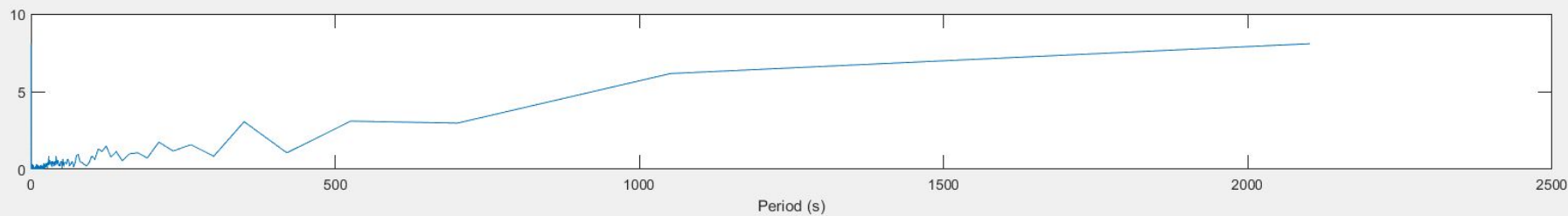
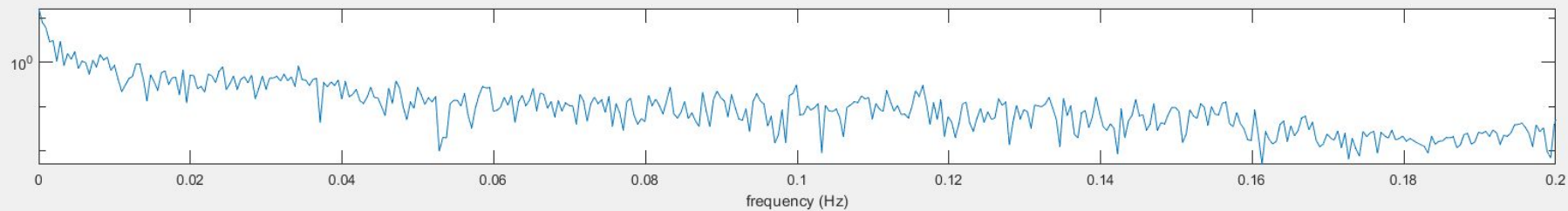
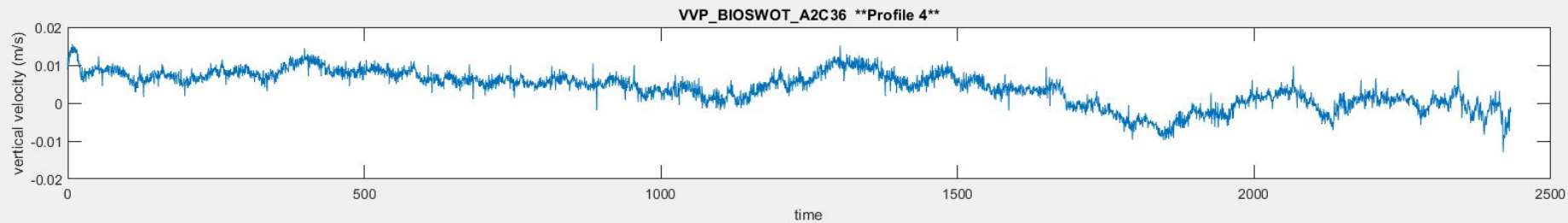
Slides pour Stephanie

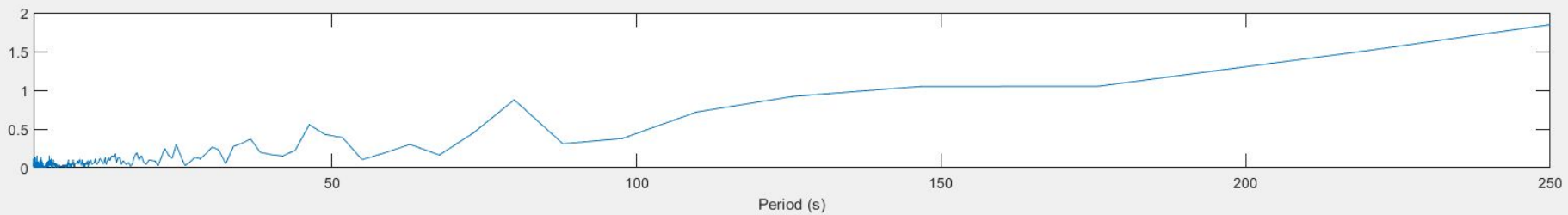
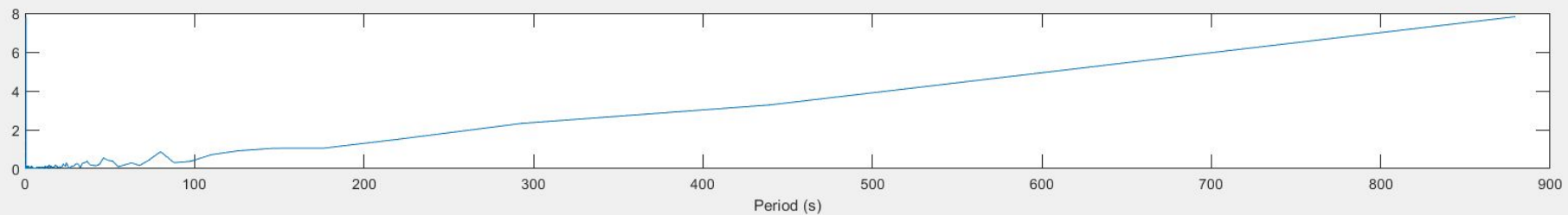
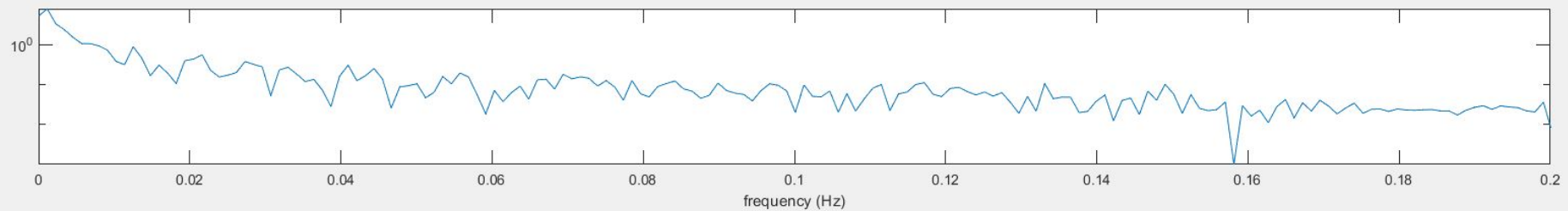
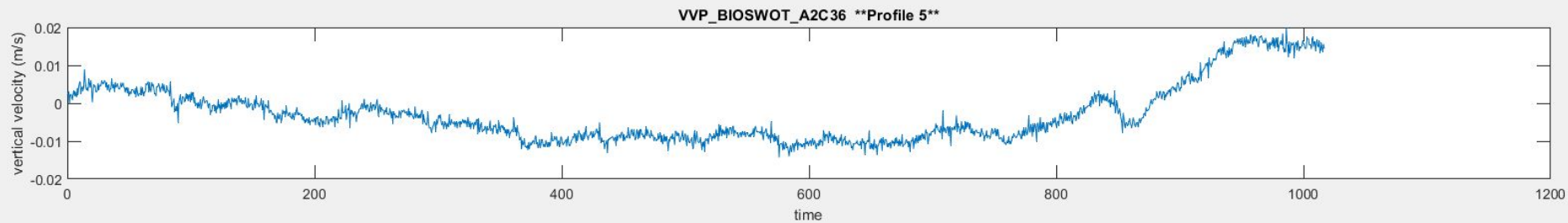
For all plots:

- $C_d = 3.2$
- $\text{Beta} = 5.8e-5$

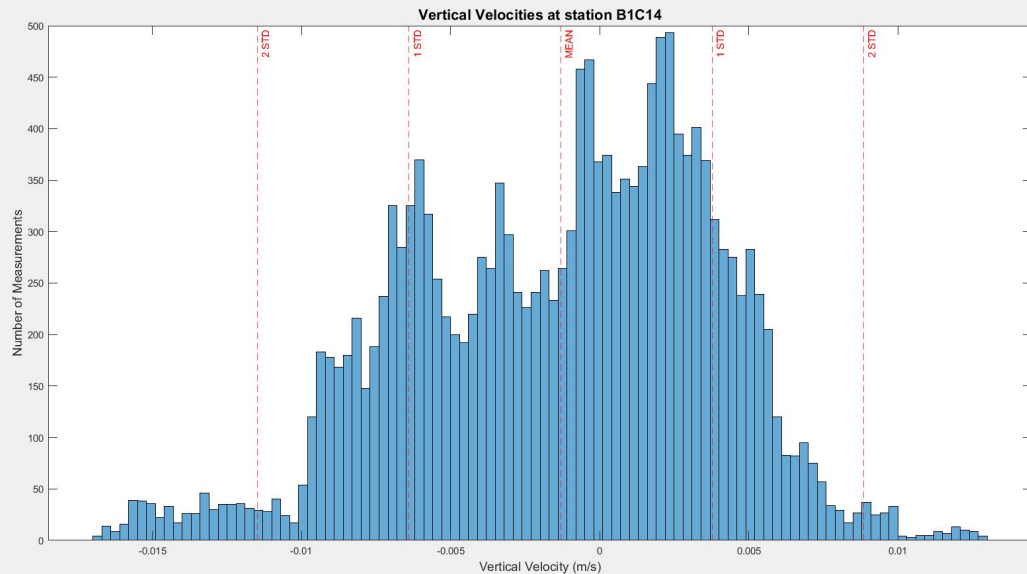






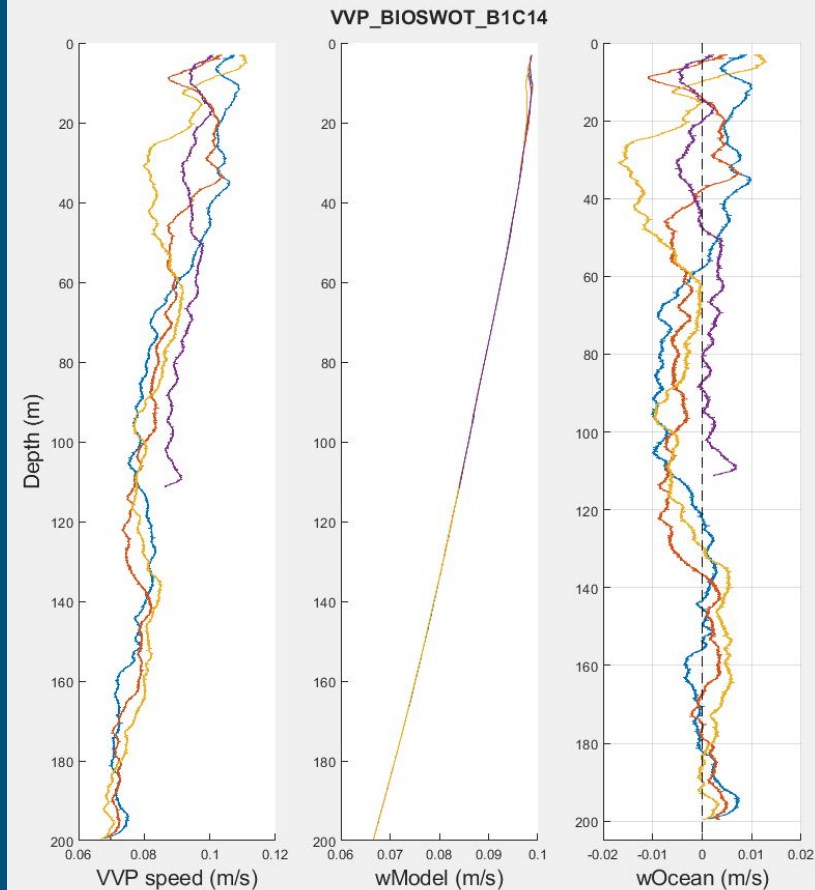


Station B1C14

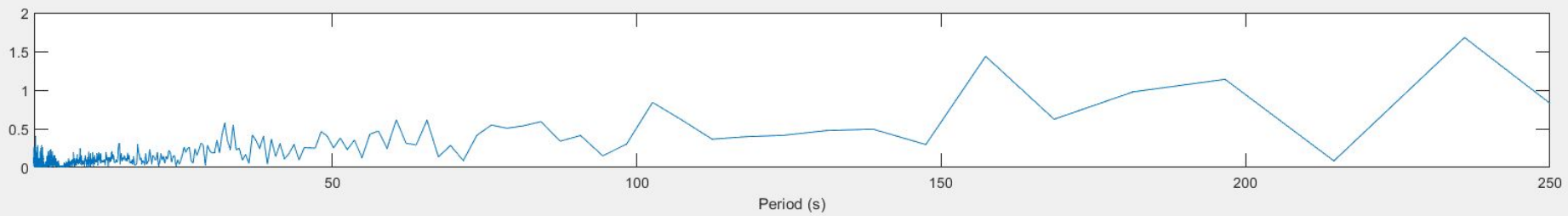
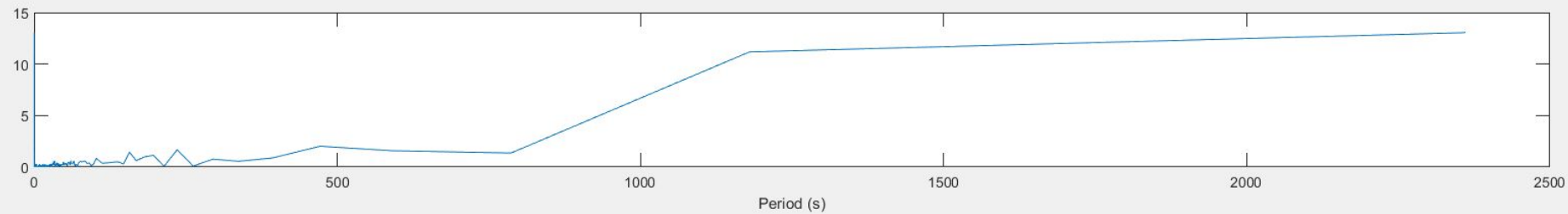
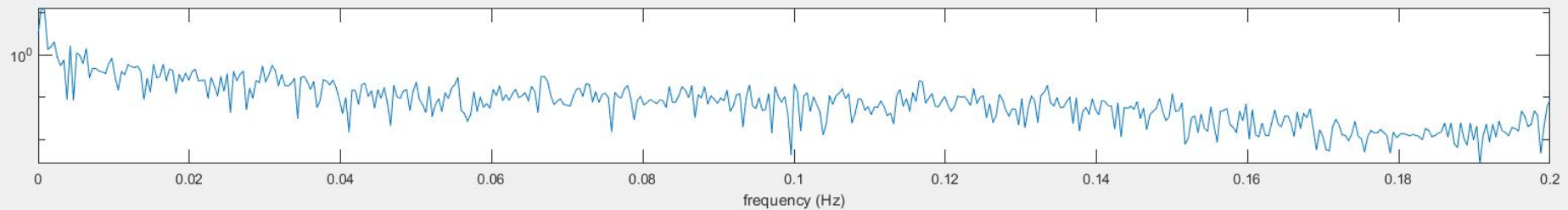
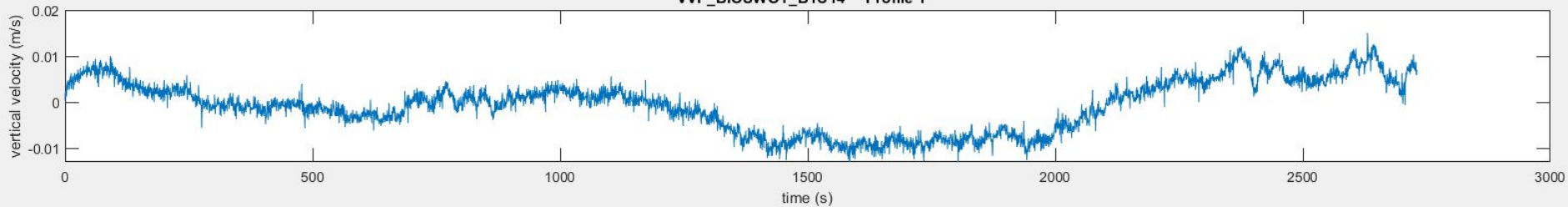


Mean: -0.0013 m/s

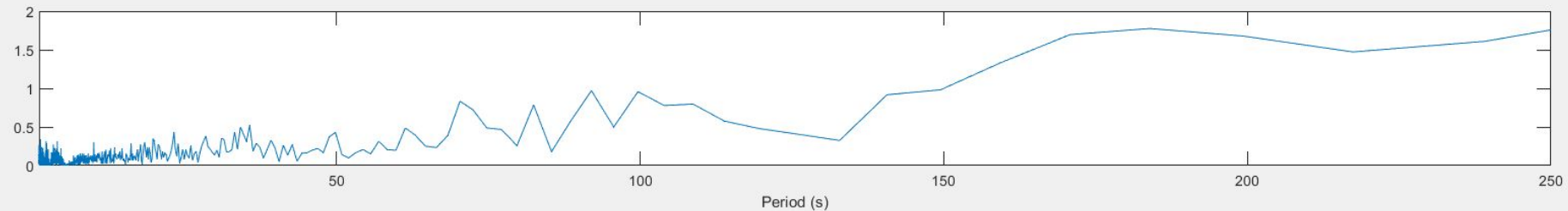
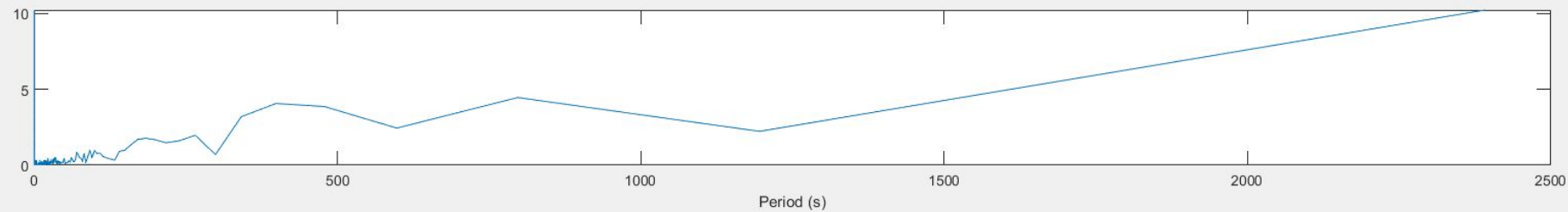
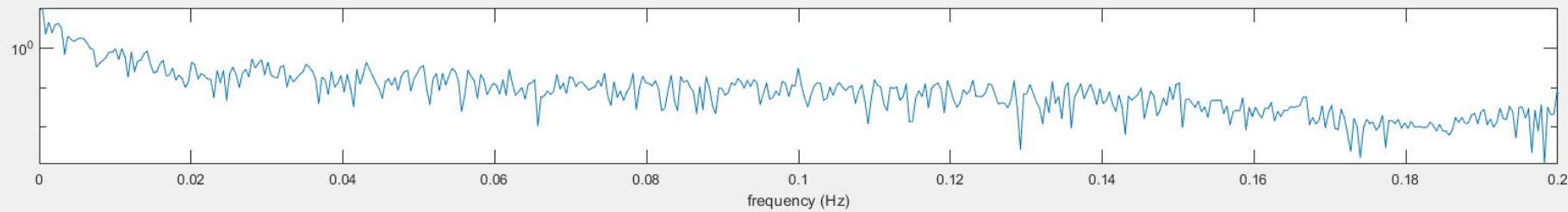
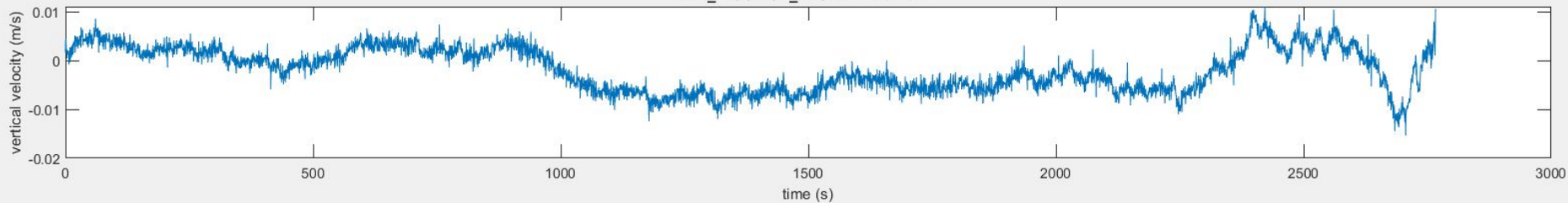
Std: 0.0051

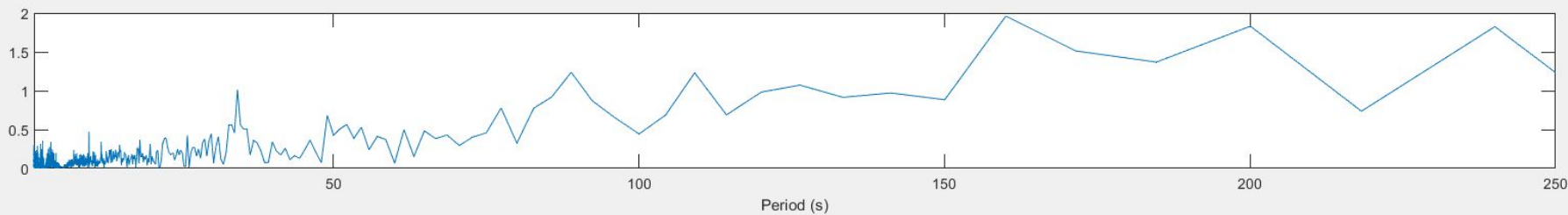
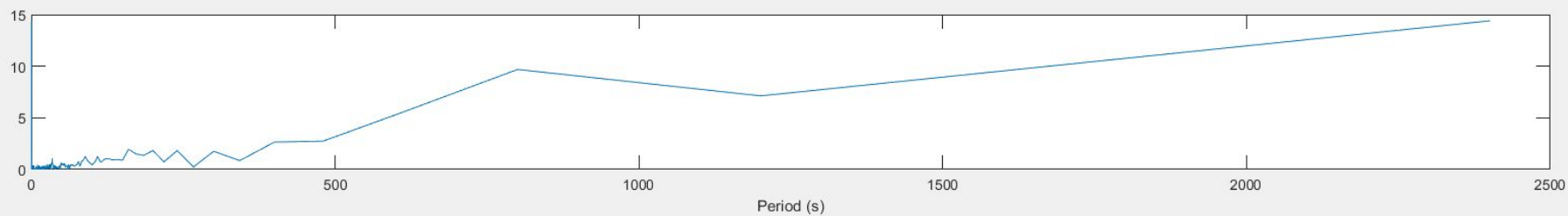
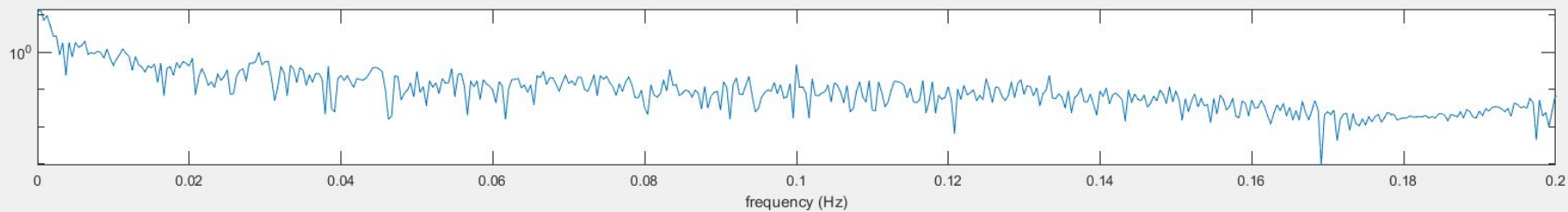
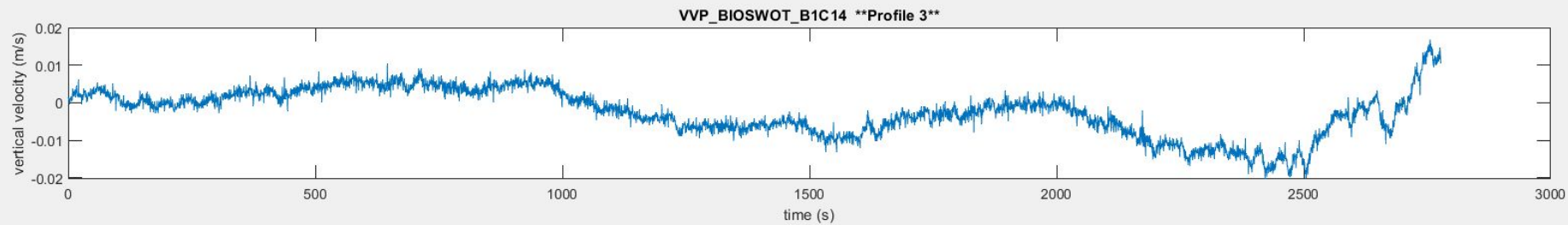


VVP_BIOSWOT_B1C14 **Profile 1**

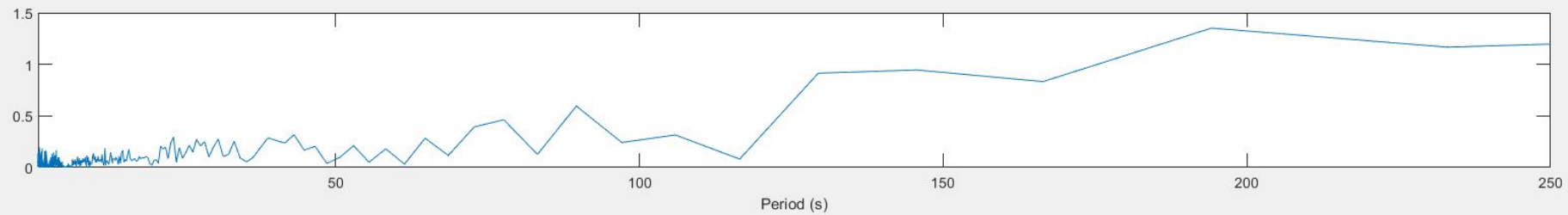
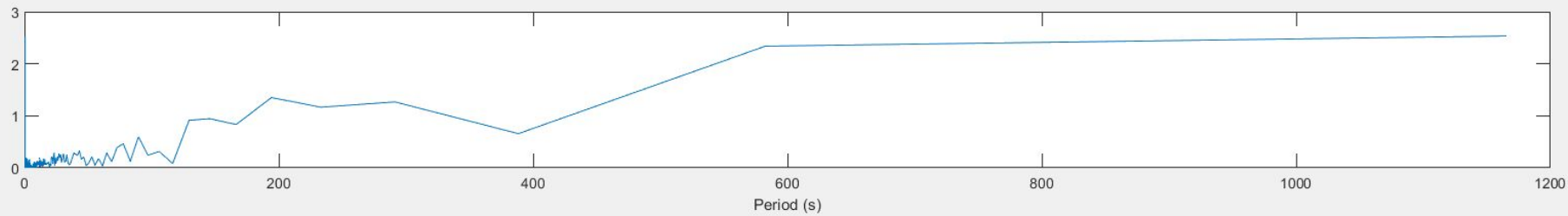
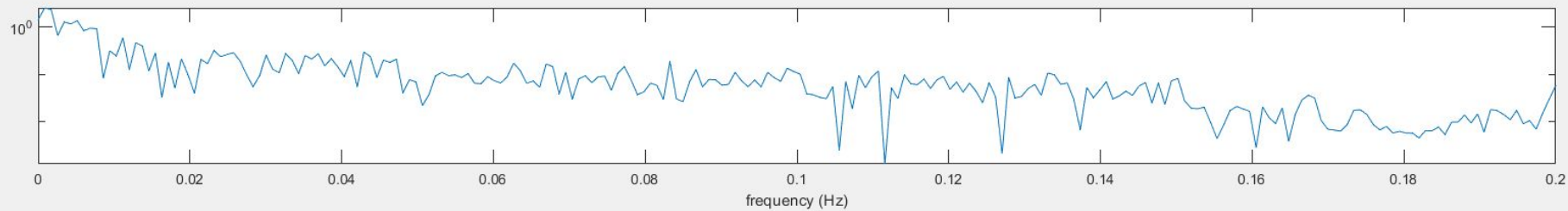
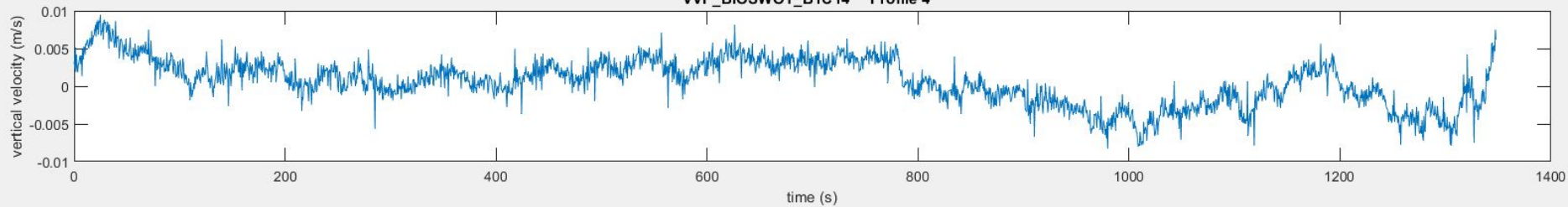


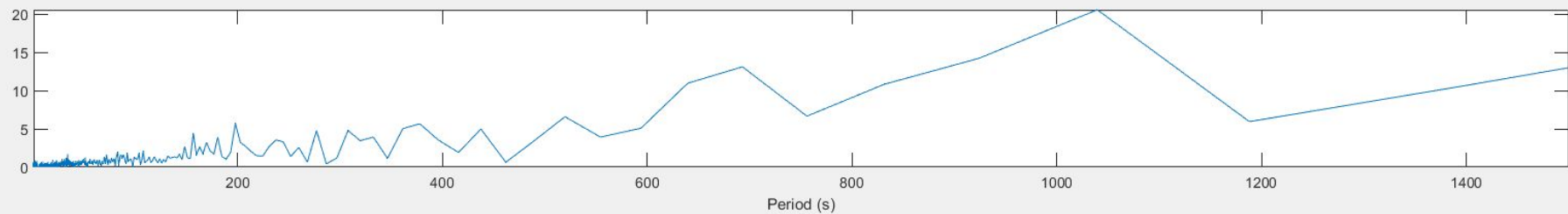
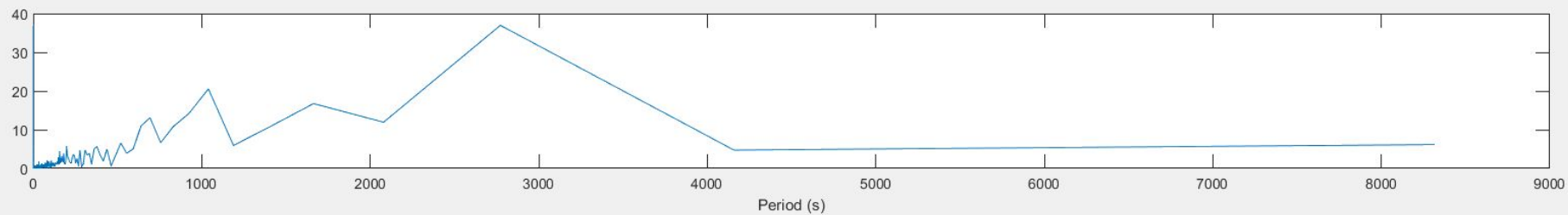
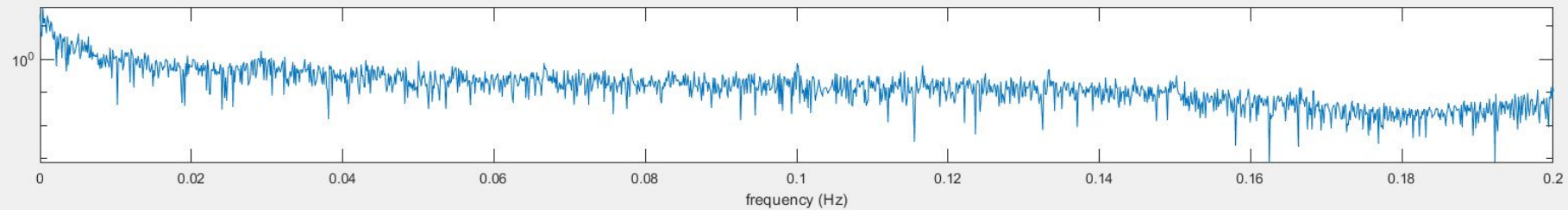
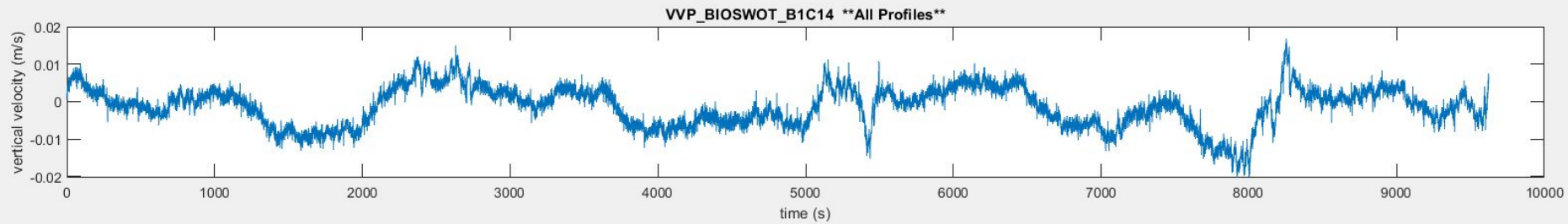
VVP_BIOSWOT_B1C14 **Profile 2**



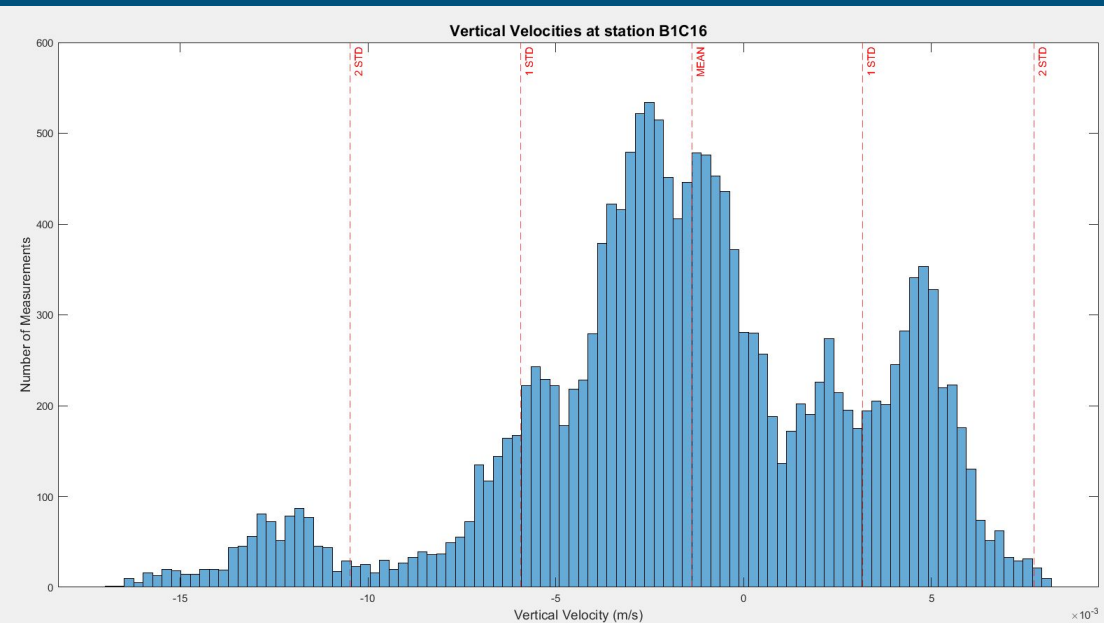


VVP_BIOSWOT_B1C14 **Profile 4**



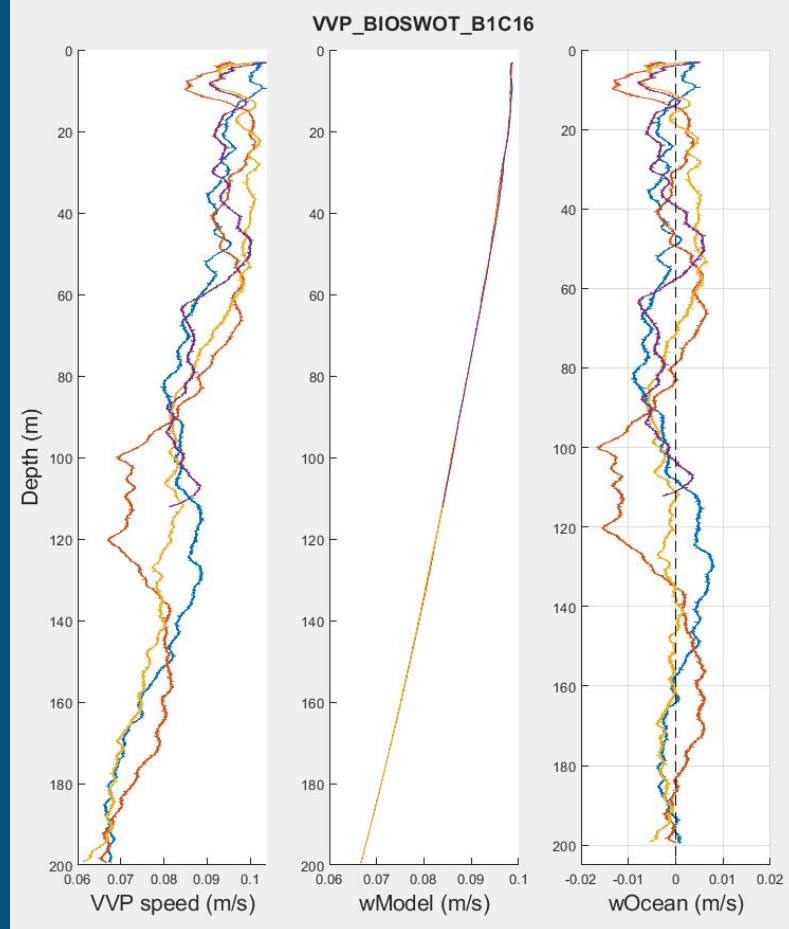


Station B1C16

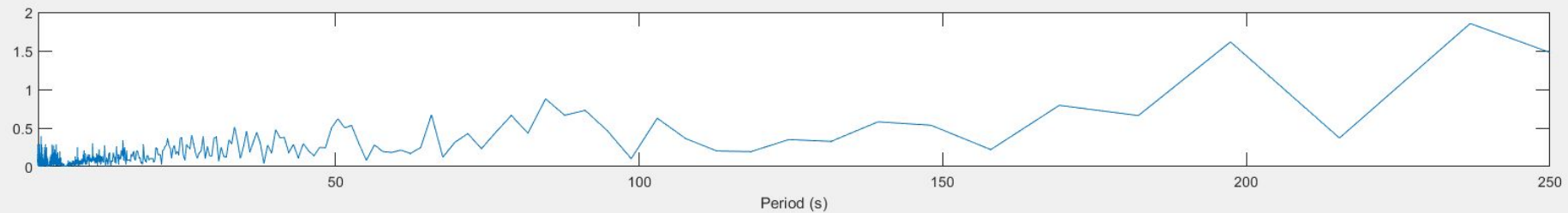
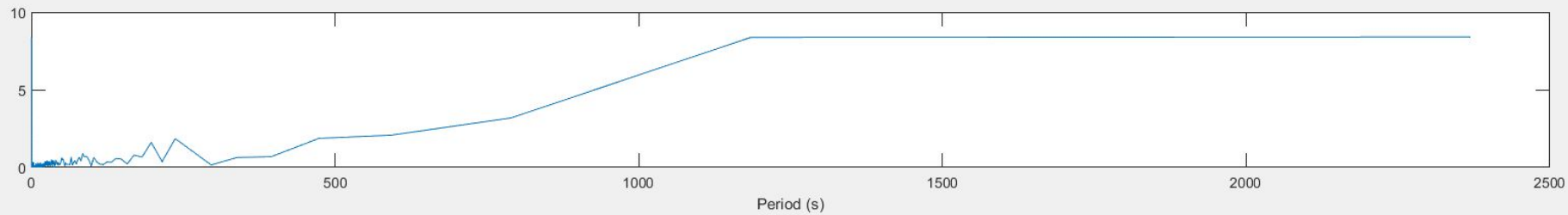
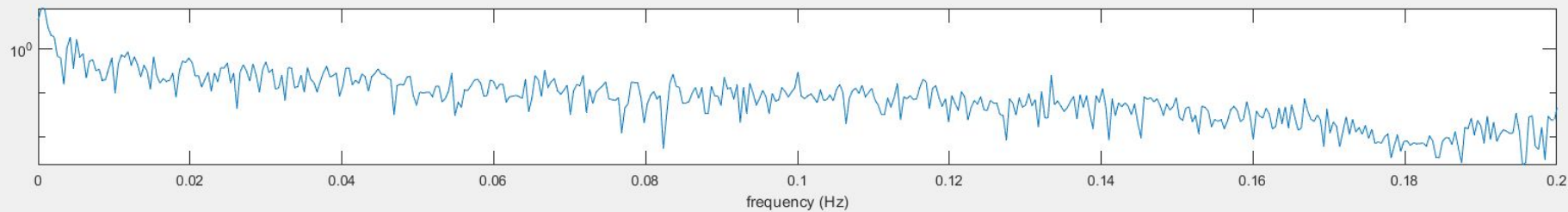
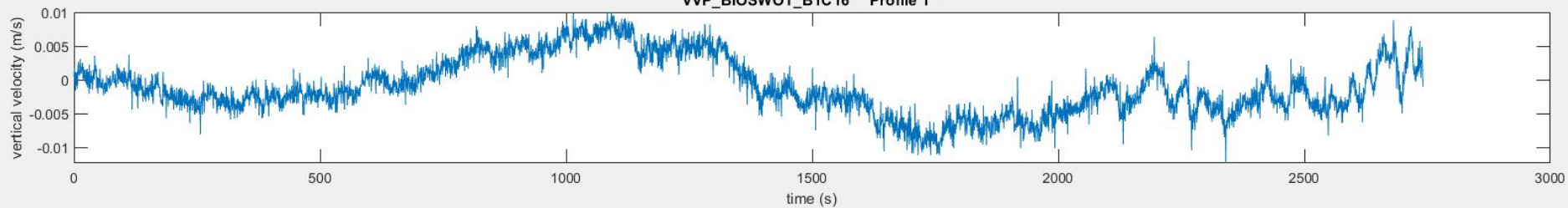


Mean: -0.0014 m/s

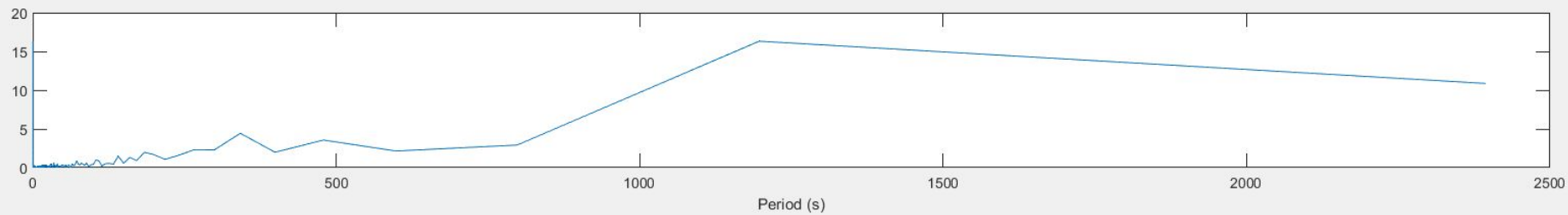
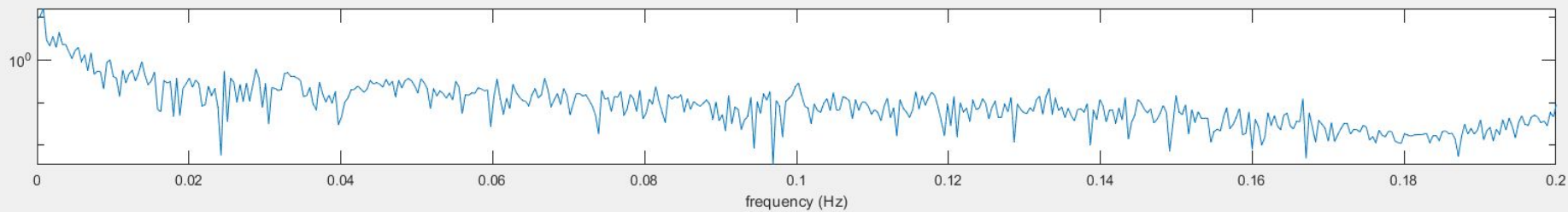
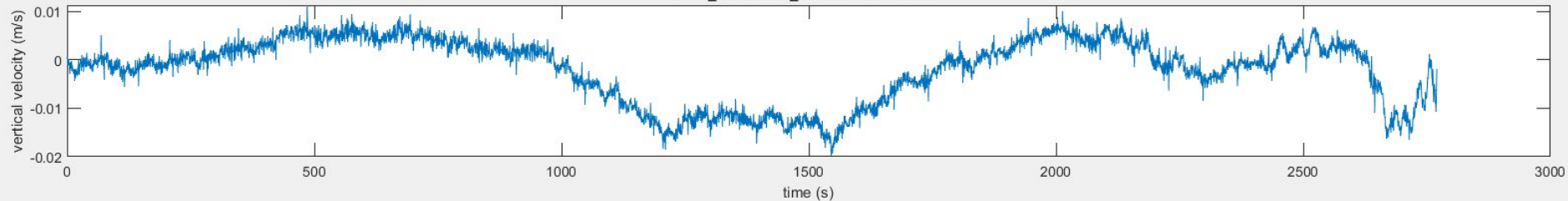
Std: 0.0046



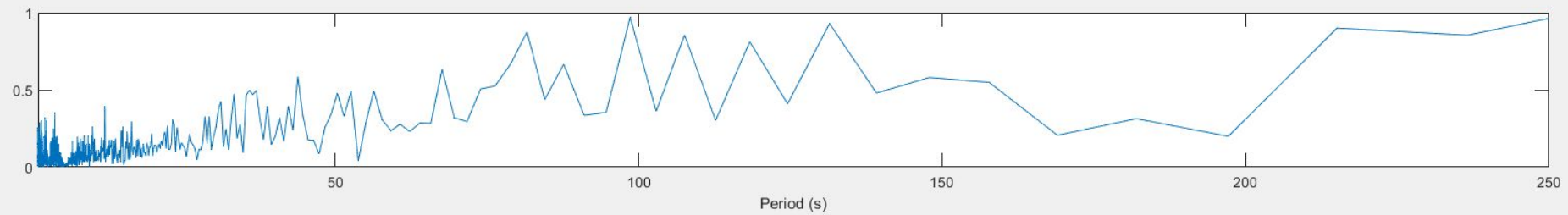
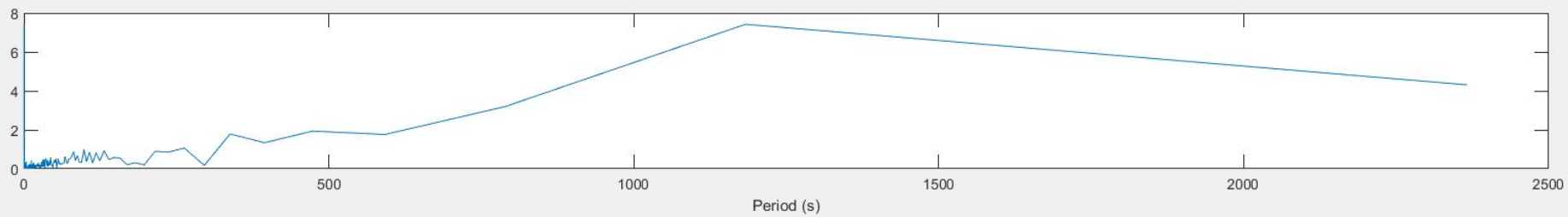
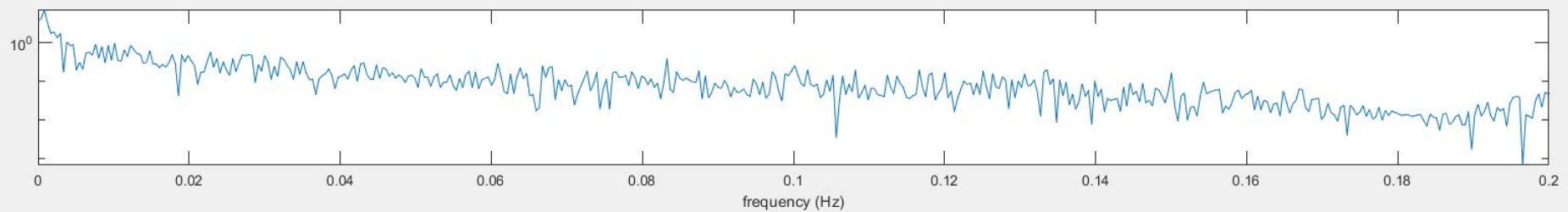
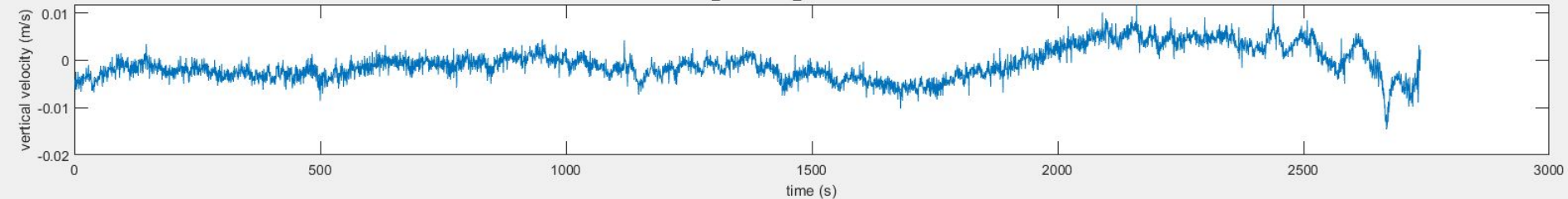
VVP_BIOSWOT_B1C16 **Profile 1**

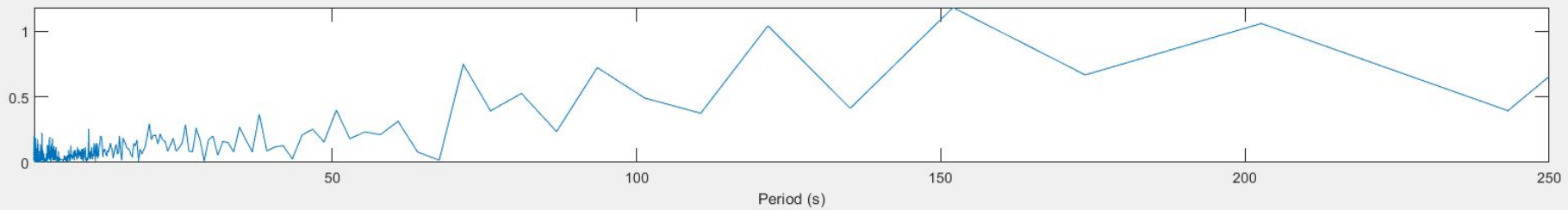
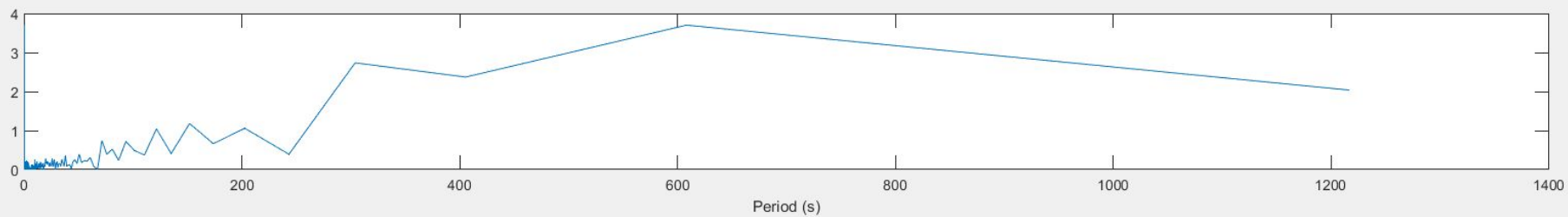
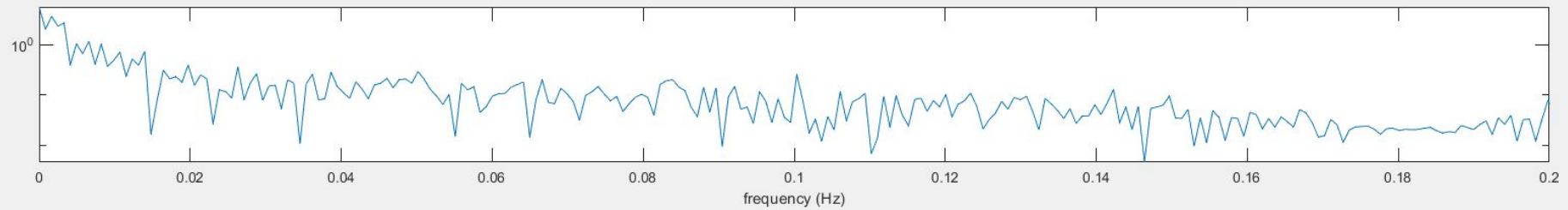
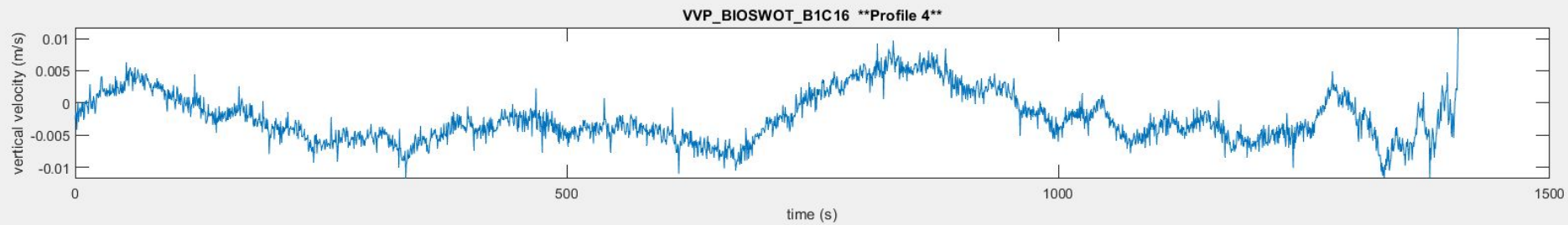


VVP_BIOSWOT_B1C16 **Profile 2**

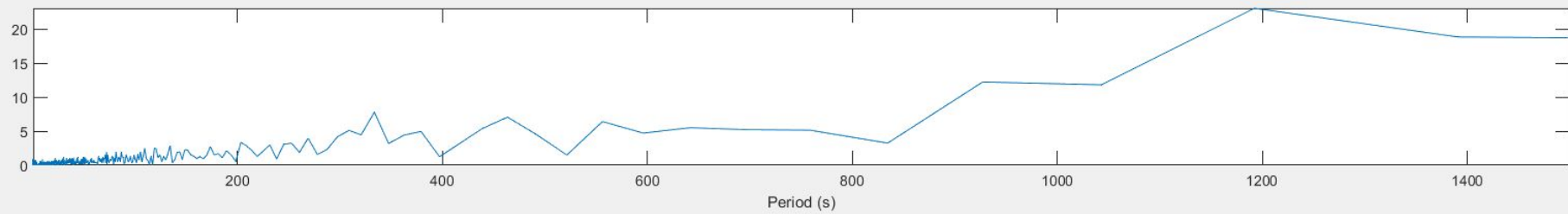
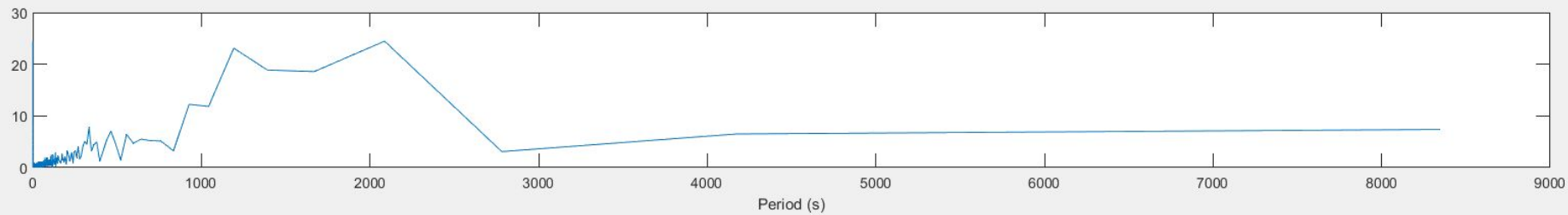
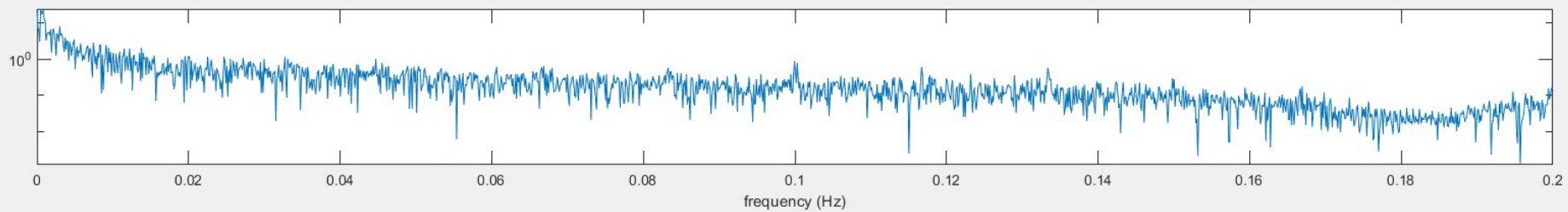
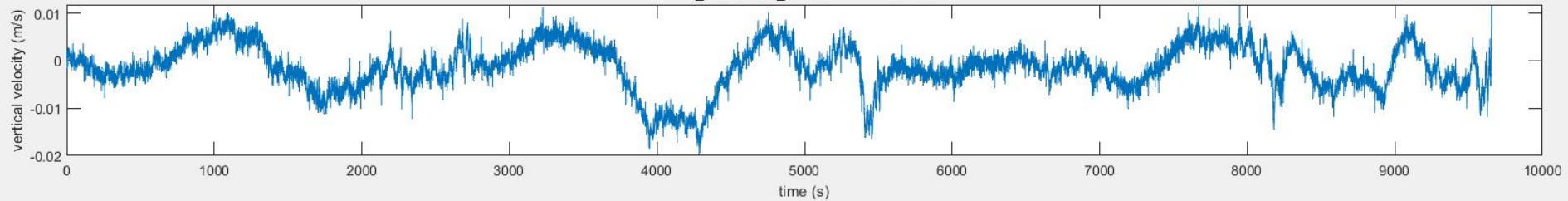


VVP_BIOSWOT_B1C16 **Profile 3**

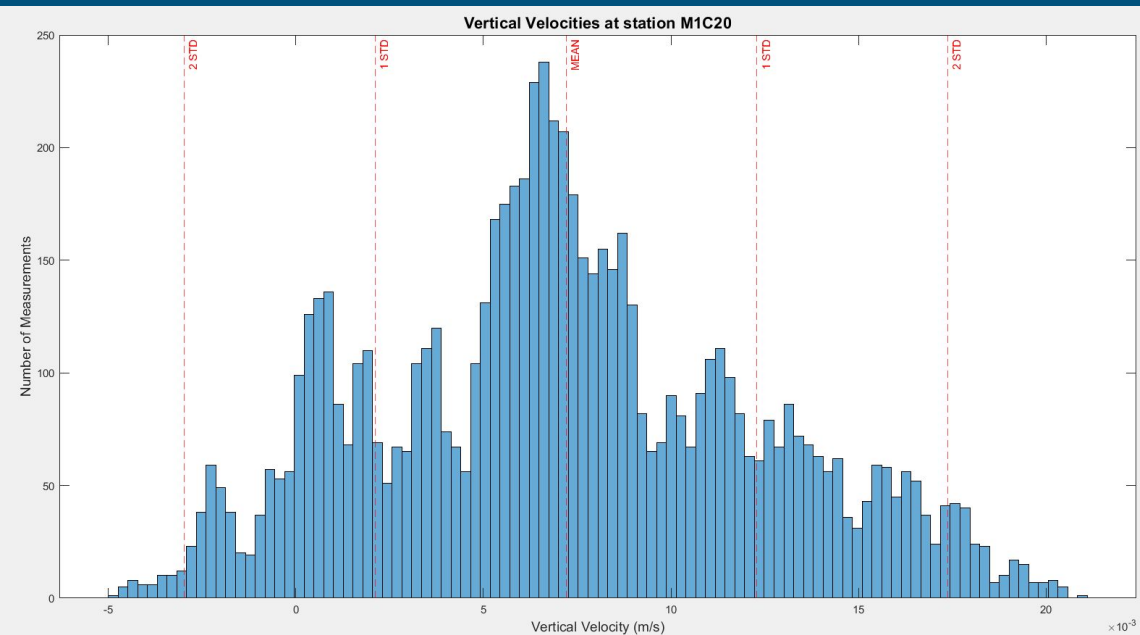




VVP_BIOSWOT_B1C16 **All Profiles**

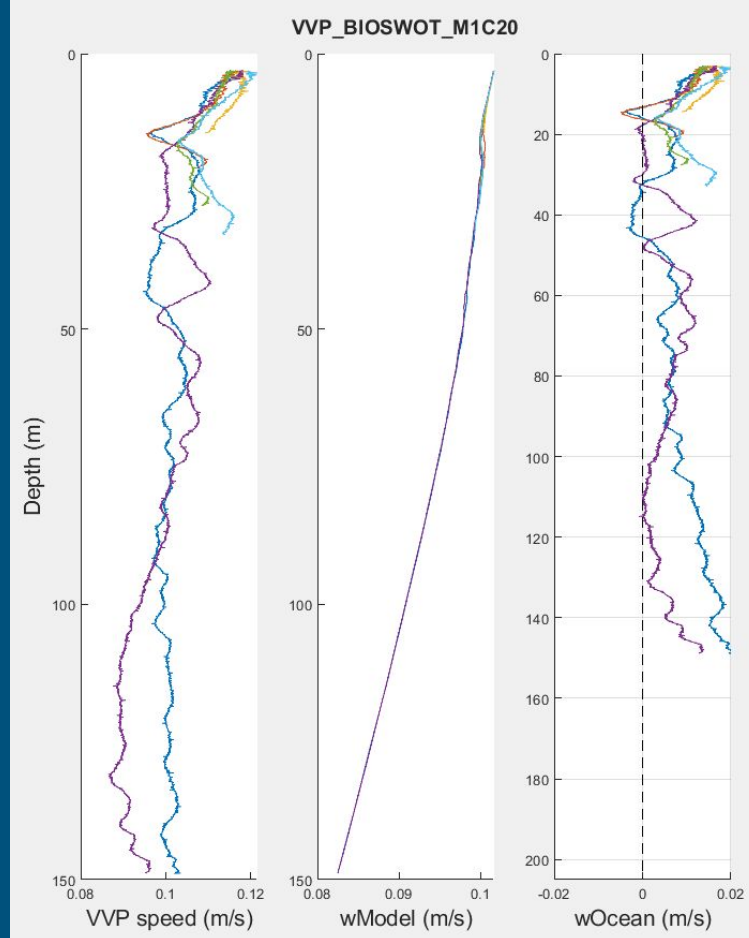


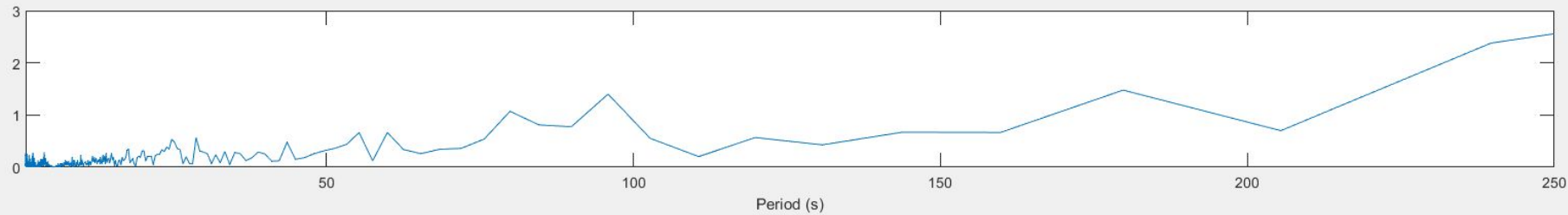
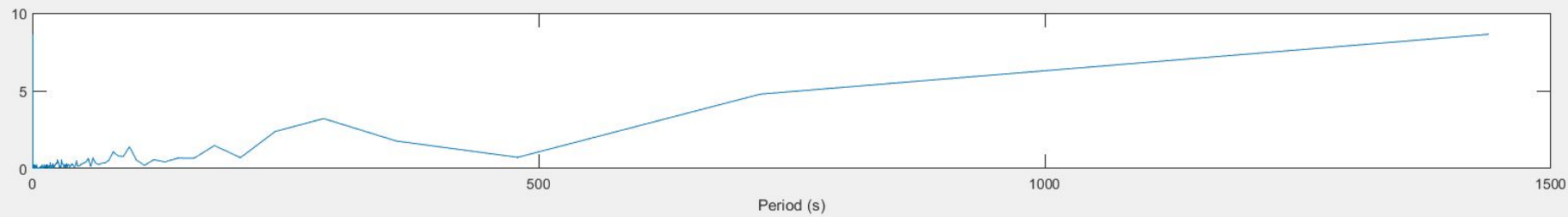
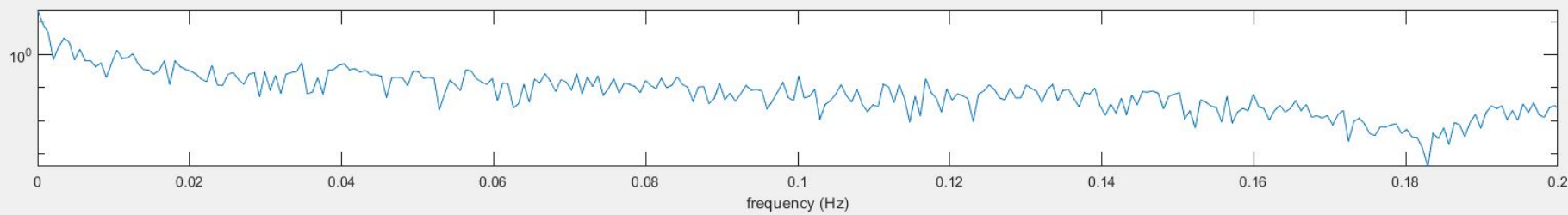
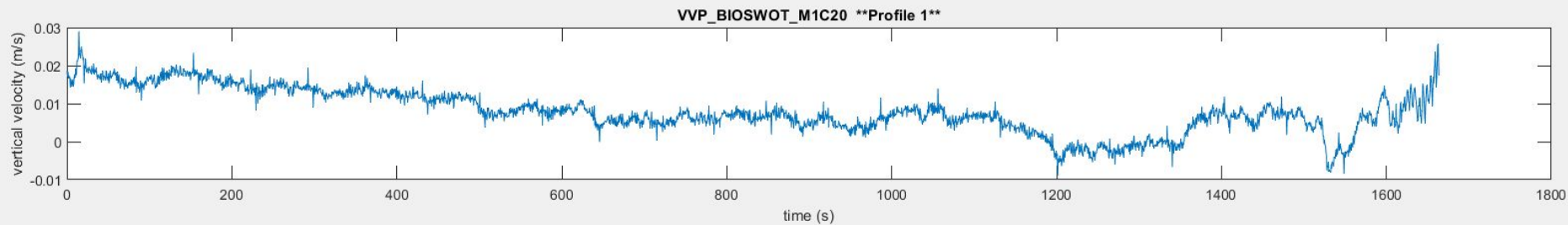
Station M1C20



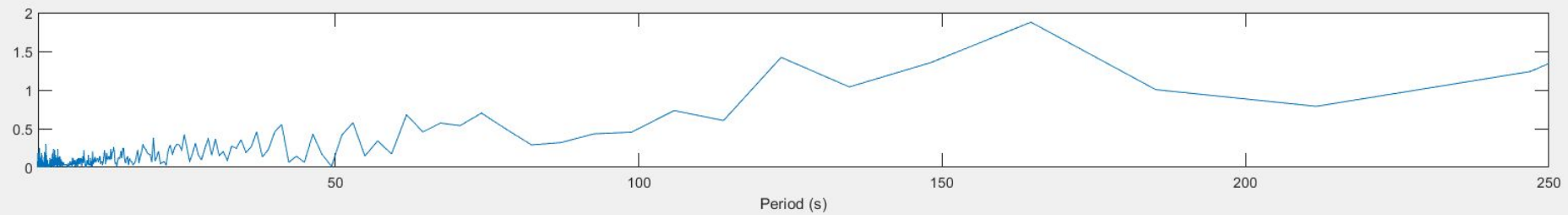
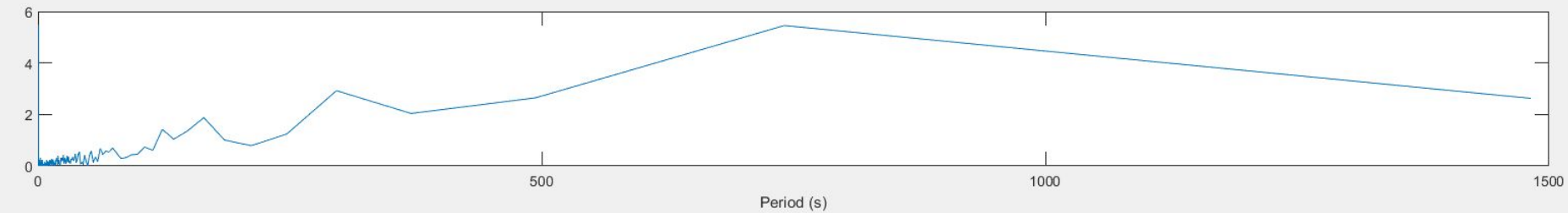
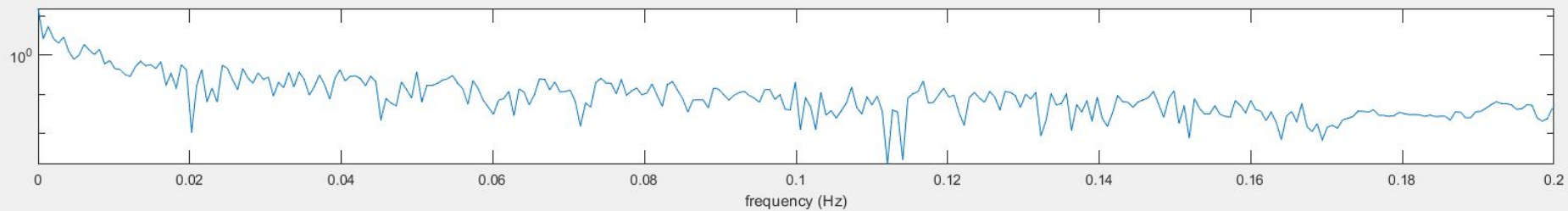
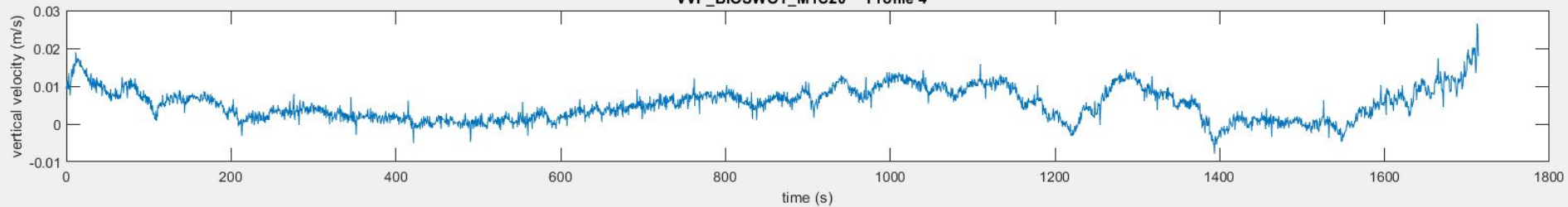
Mean: 0.0072 m/s

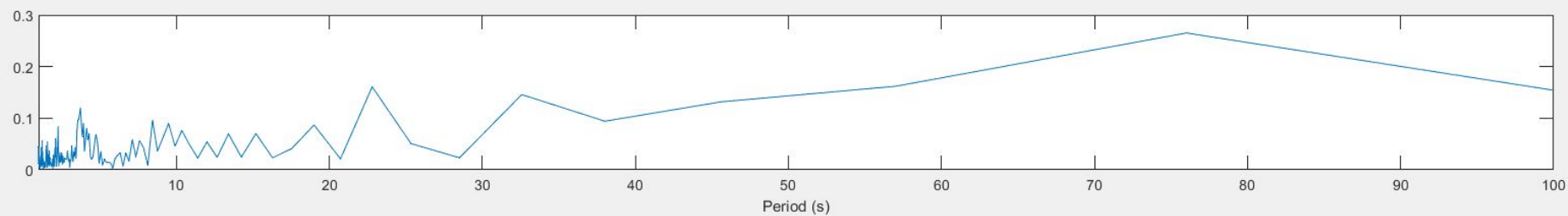
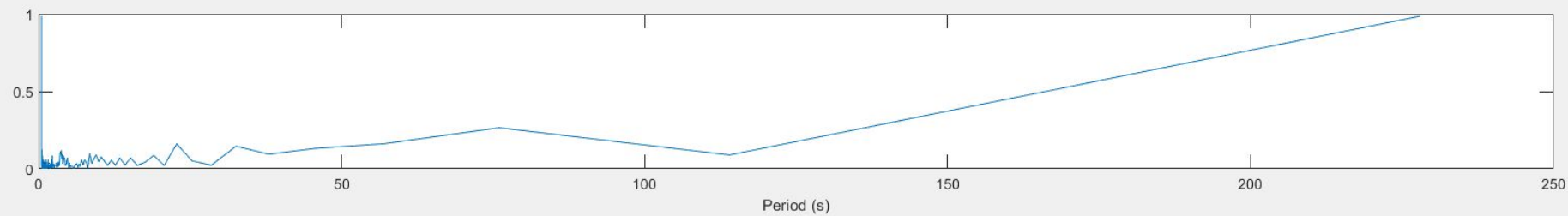
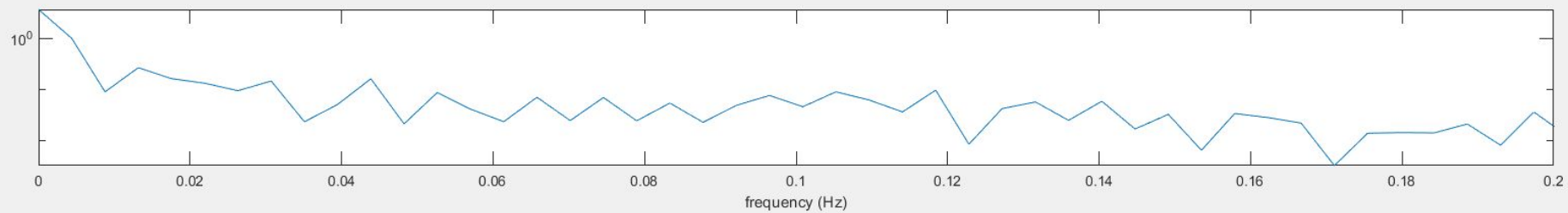
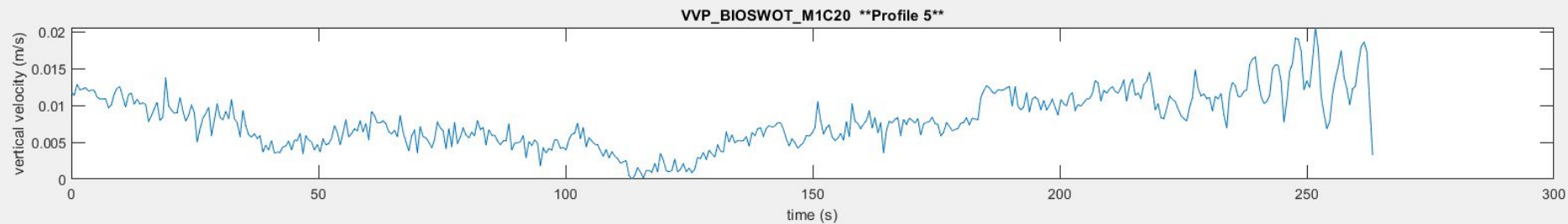
Std: 0.0051

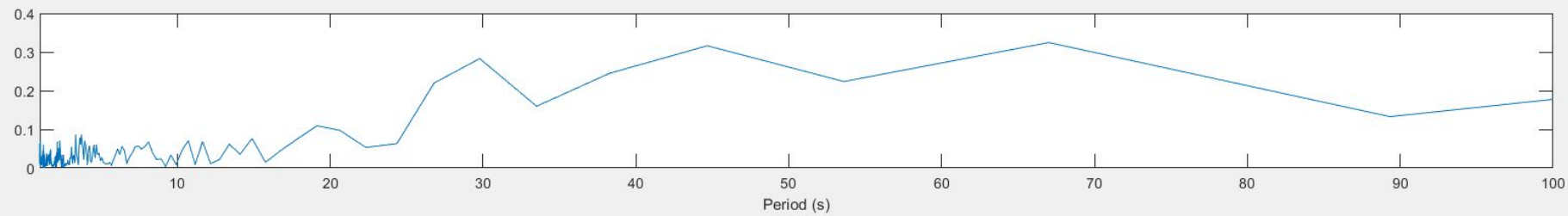
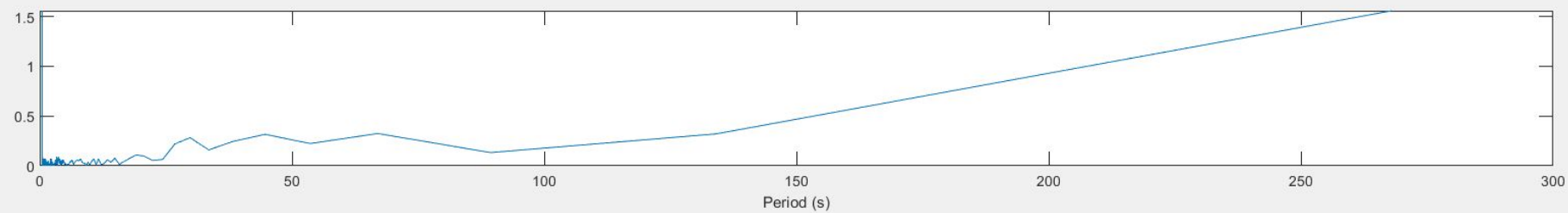
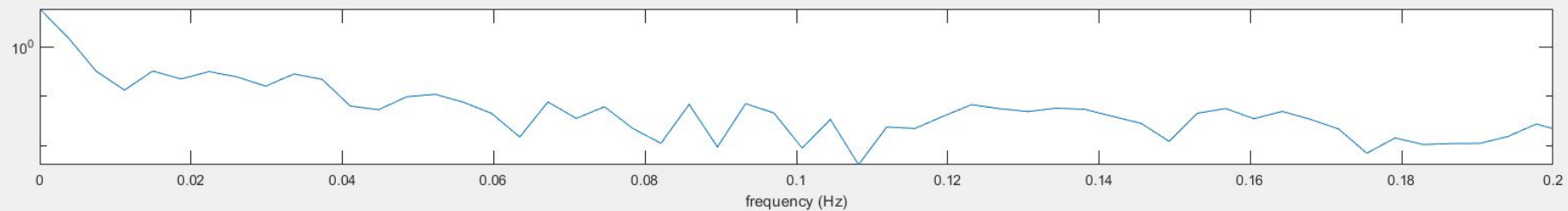
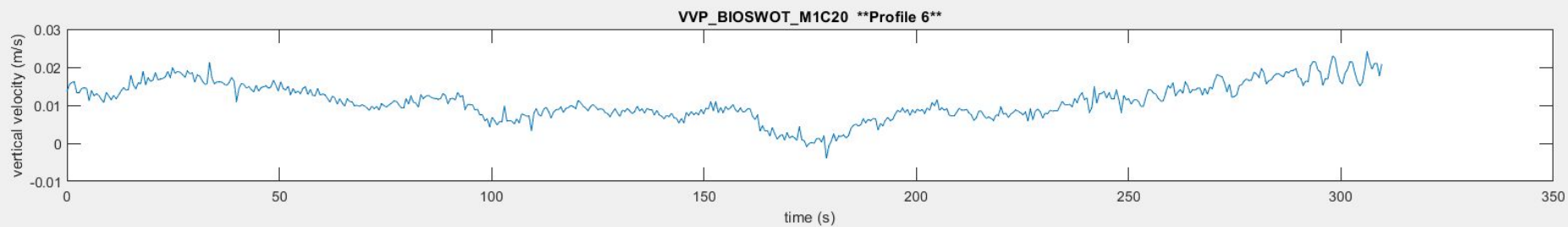




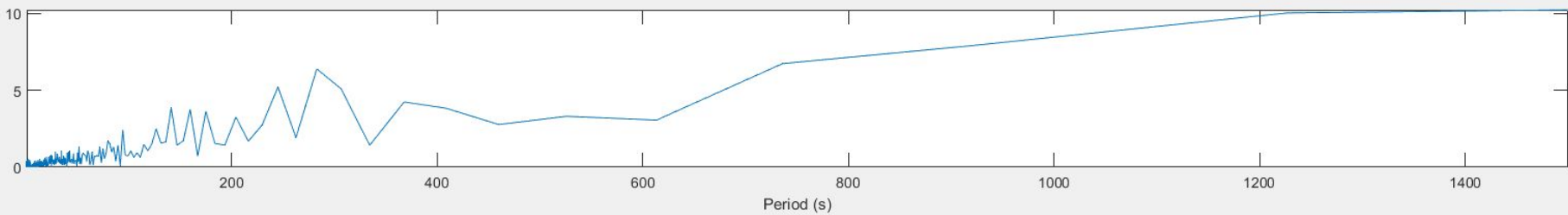
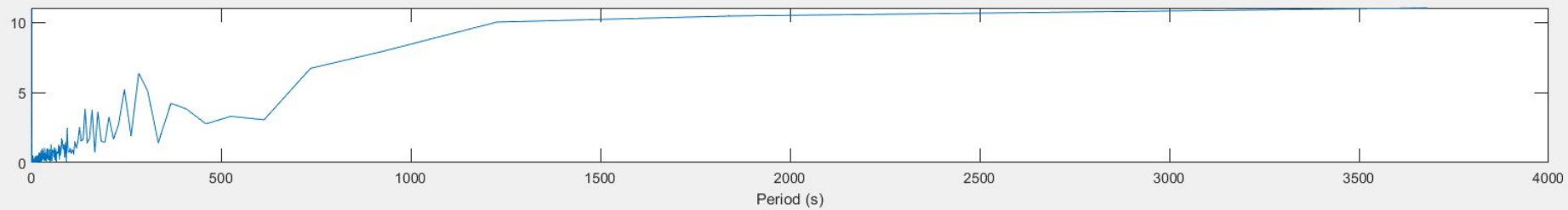
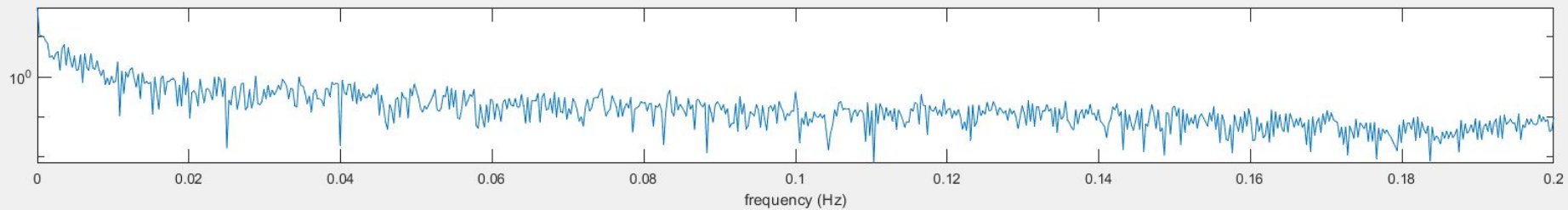
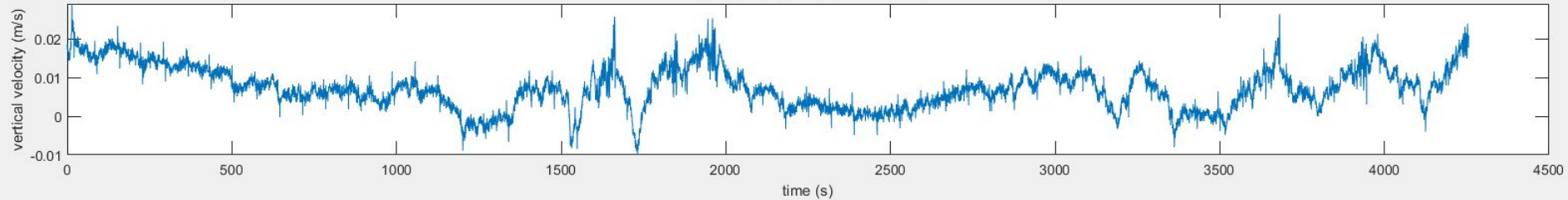
VVP_BIOSWOT_M1C20 **Profile 4**



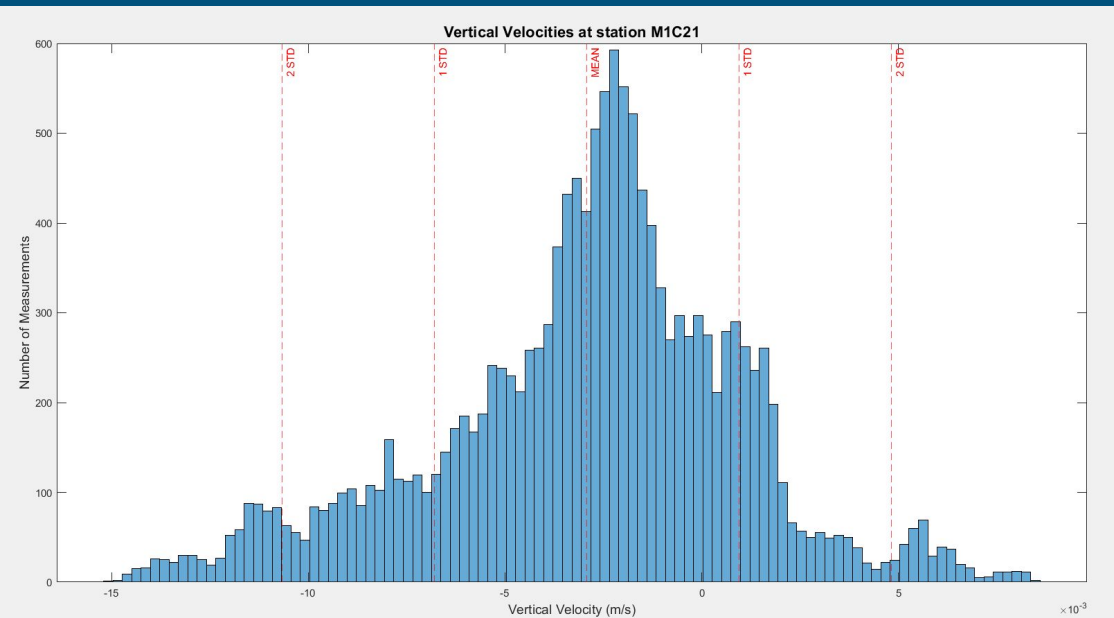




VVP_BIOSWOT_M1C20 **All Profiles**

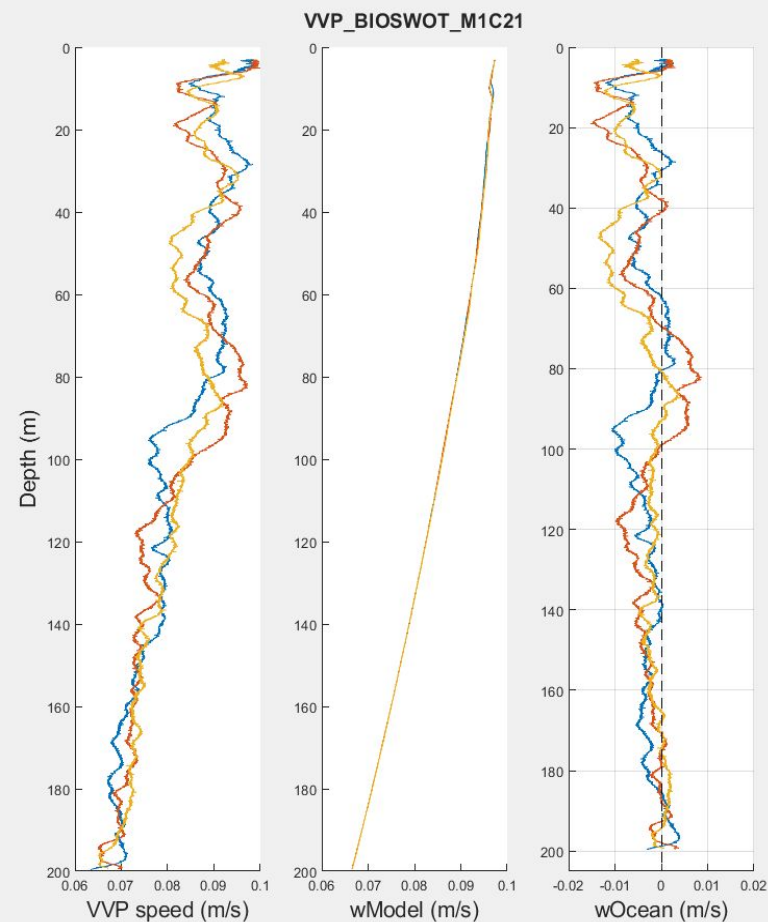


Station M1C21

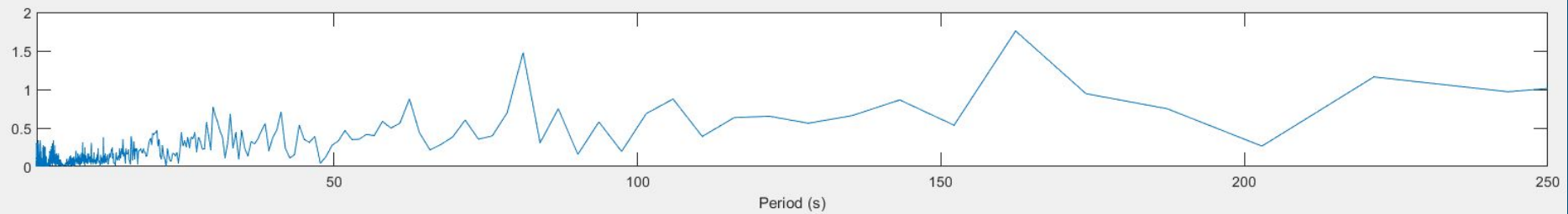
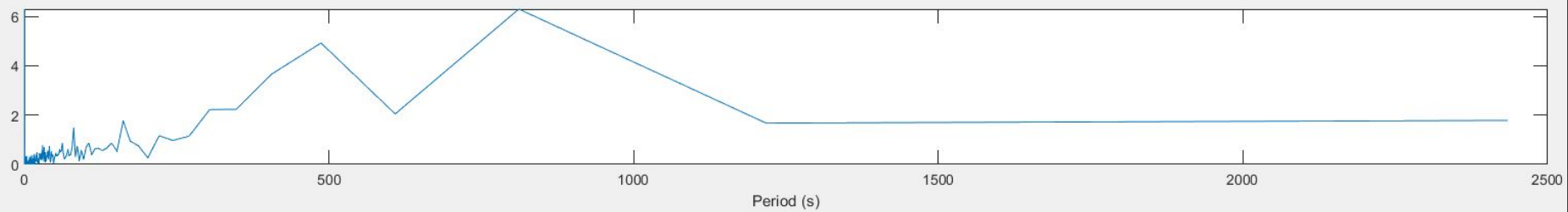
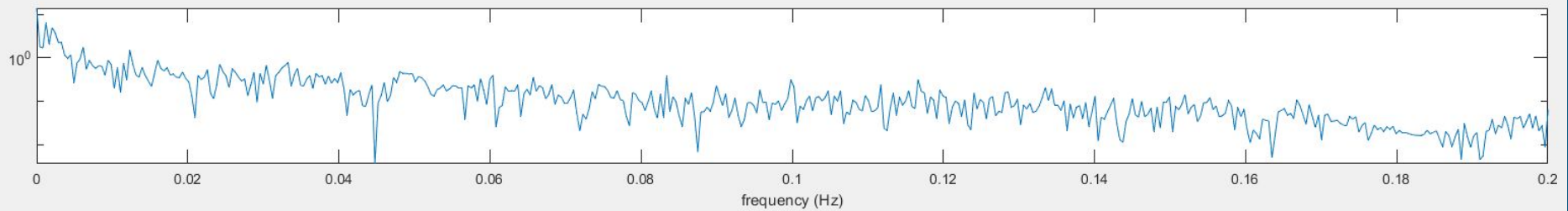
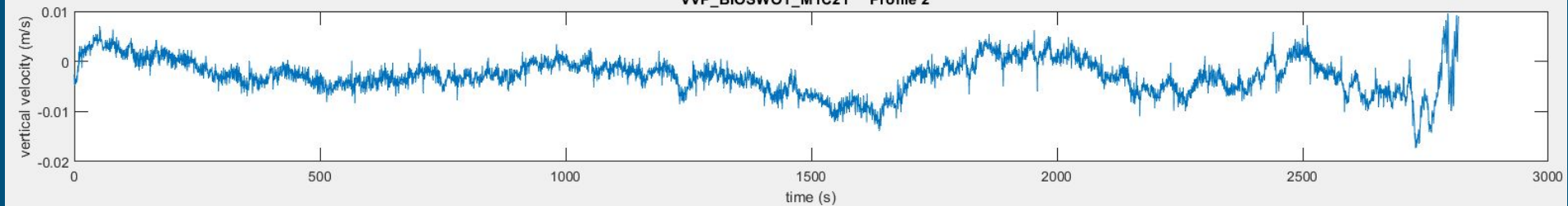


Mean: -0.0028 m/s

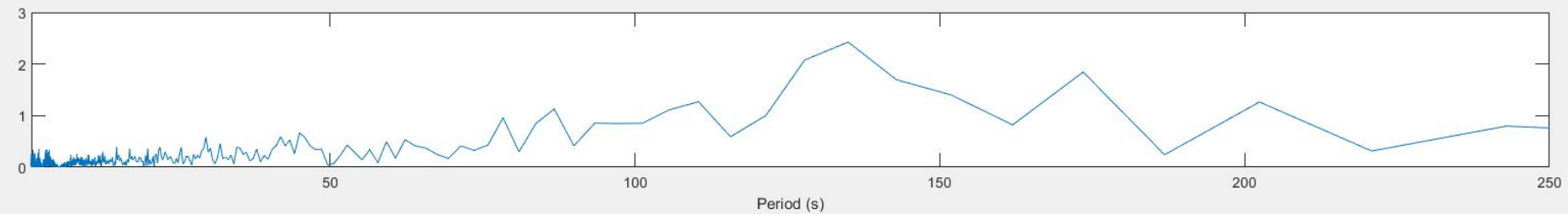
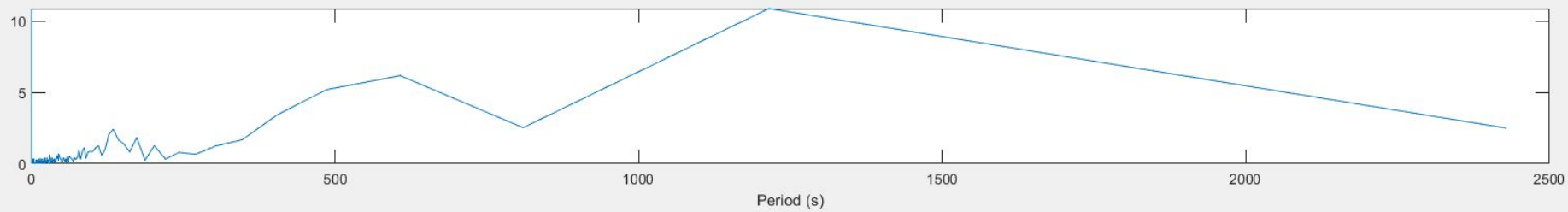
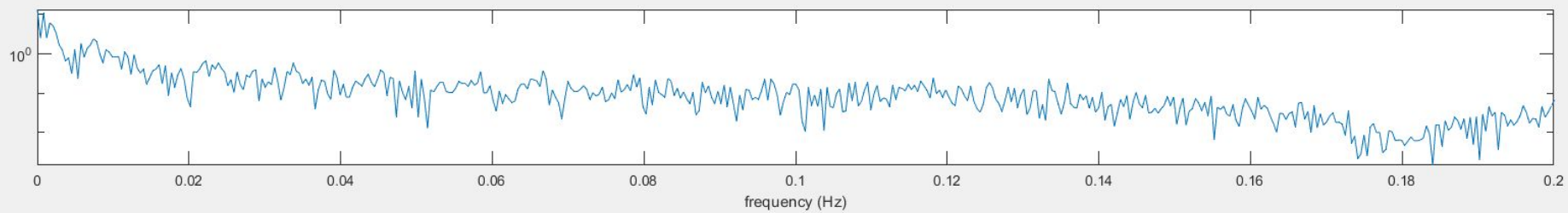
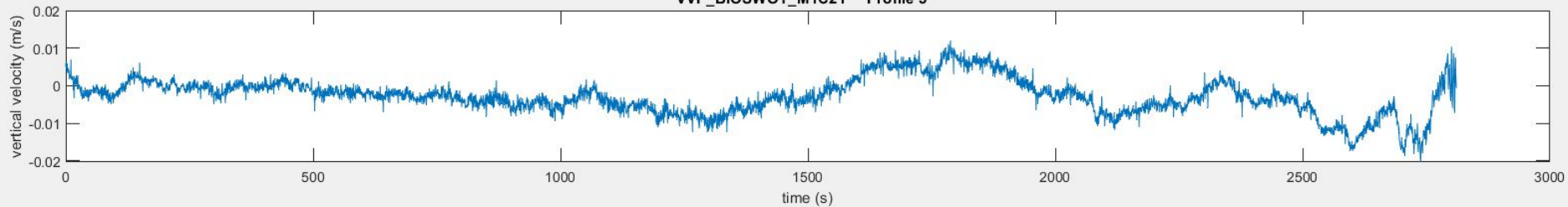
Std: 0.0052



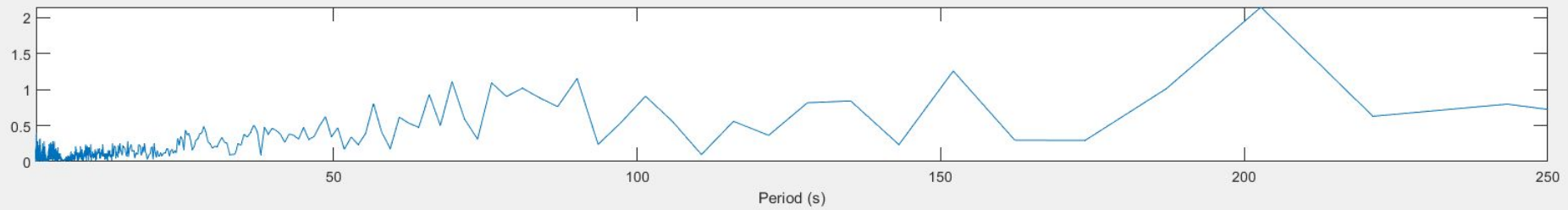
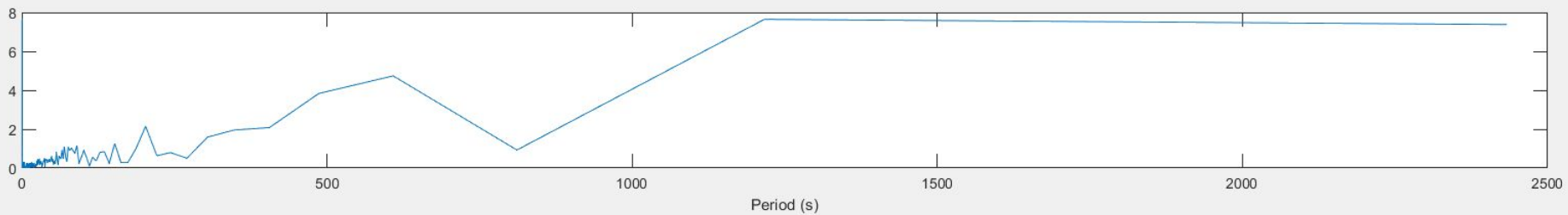
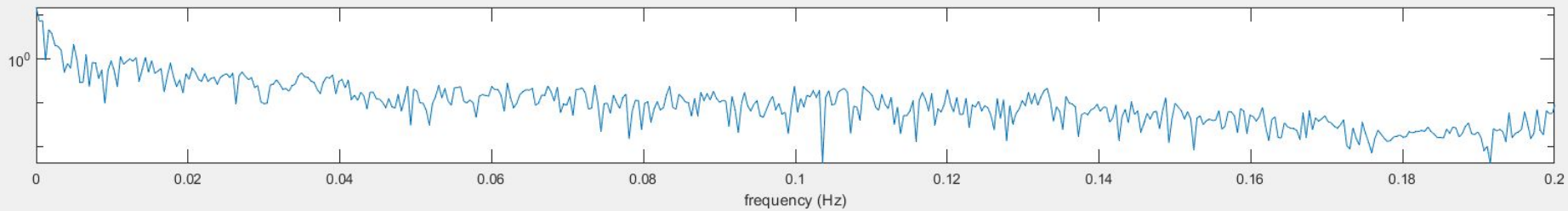
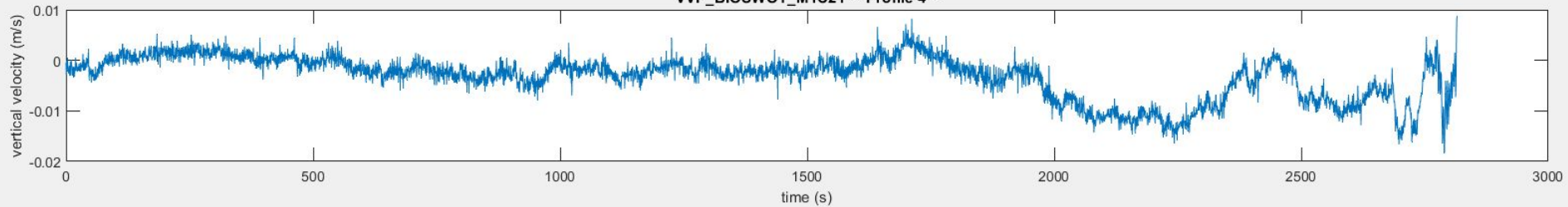
VVP_BIOSWOT_M1C21 **Profile 2**



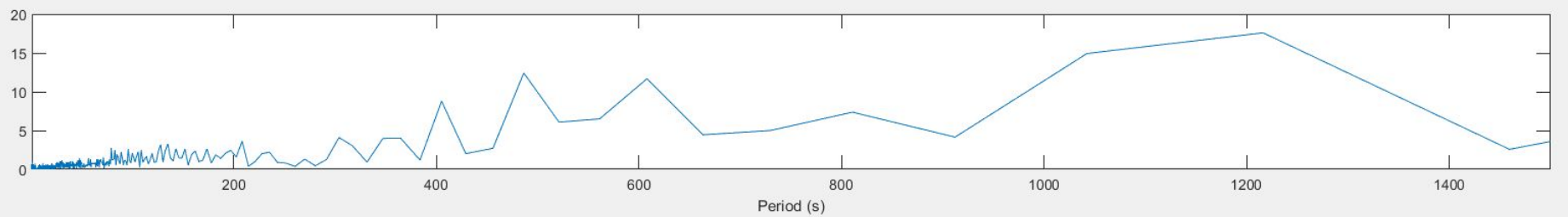
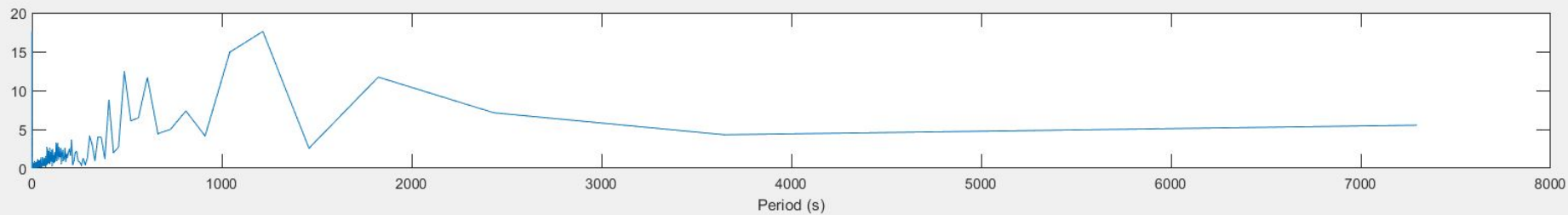
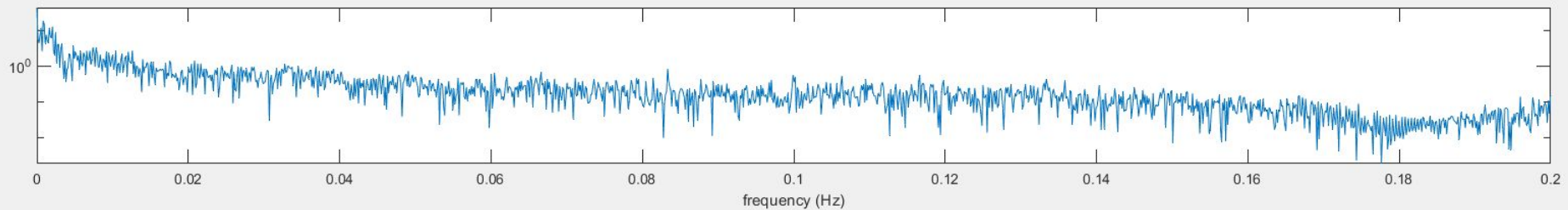
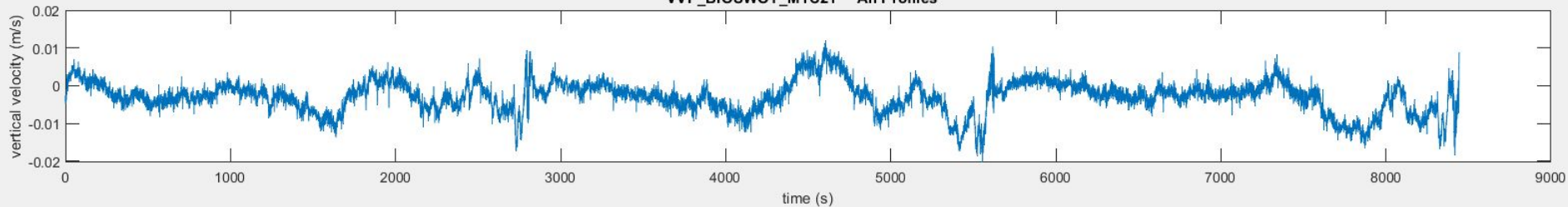
VVP_BIOSWOT_M1C21 **Profile 3**



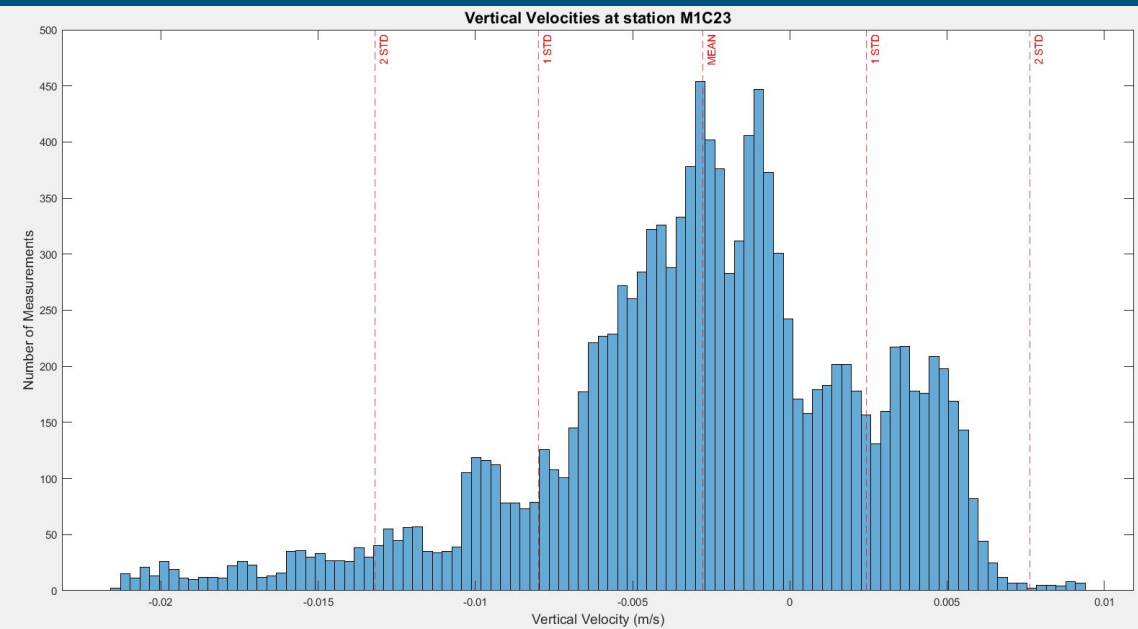
VVP_BIOSWOT_M1C21 **Profile 4**



VVP_BIOSWOT_M1C21 **All Profiles**

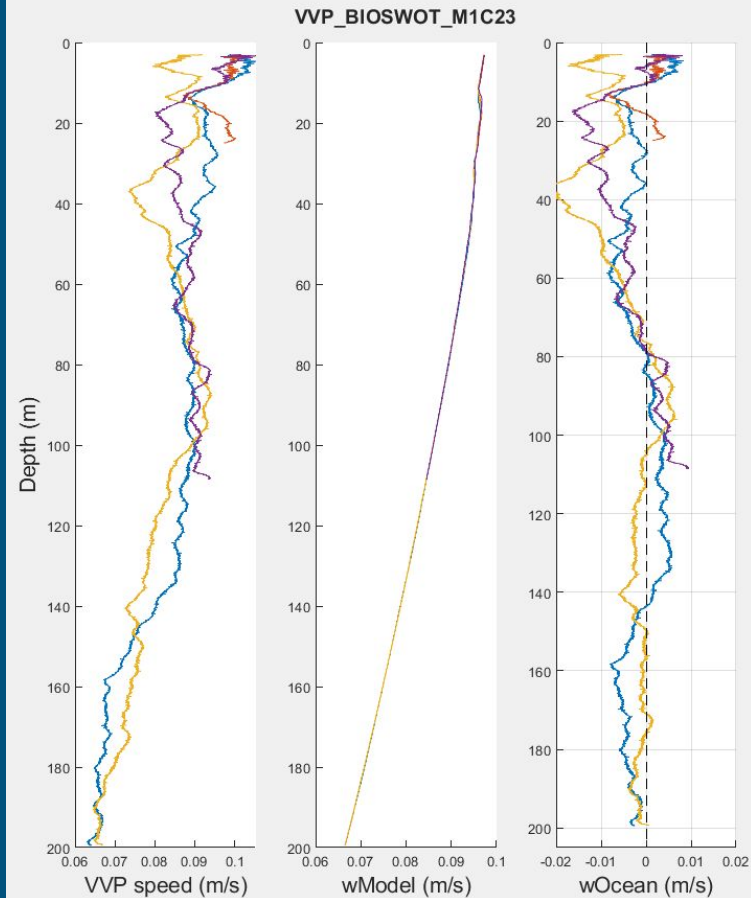


Station M1C23

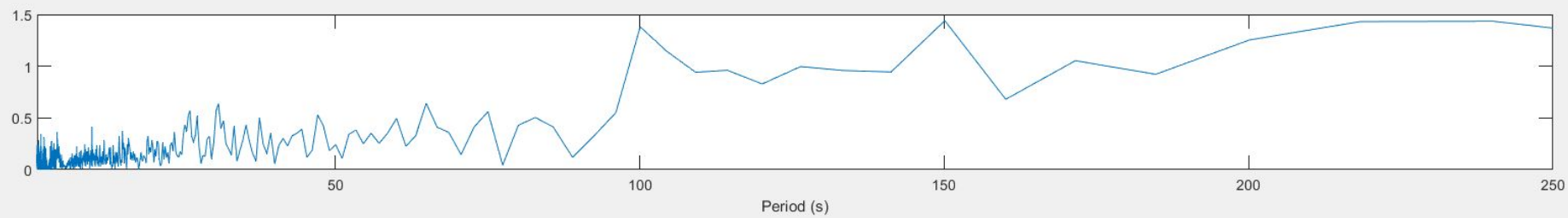
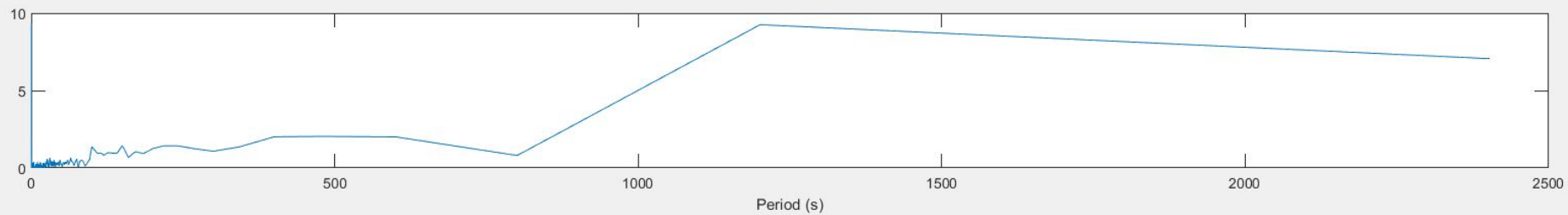
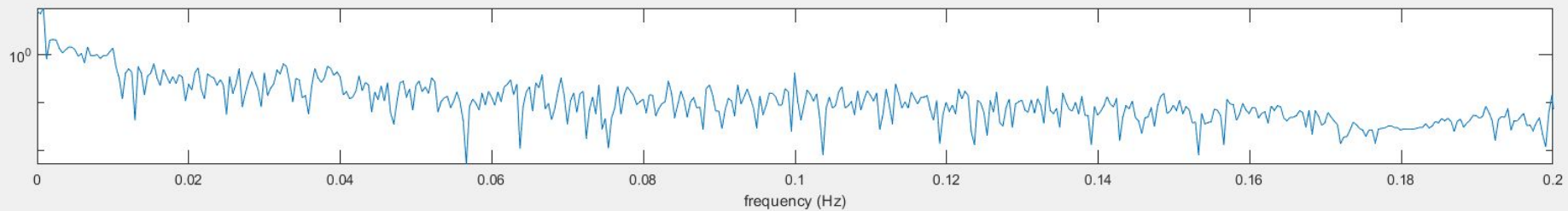
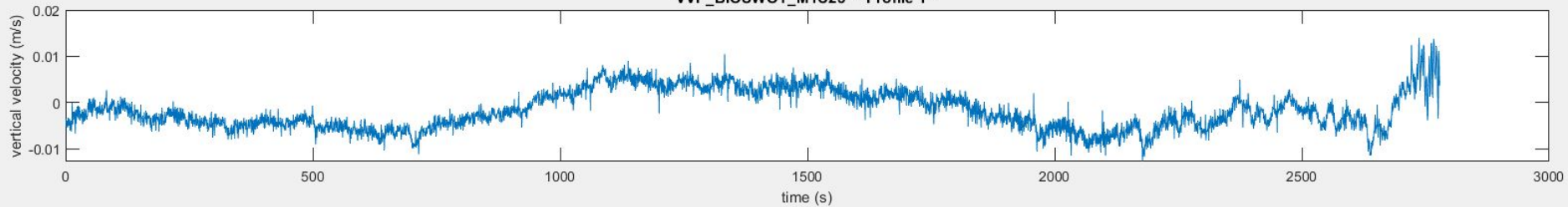


Mean: -0.0028 m/s

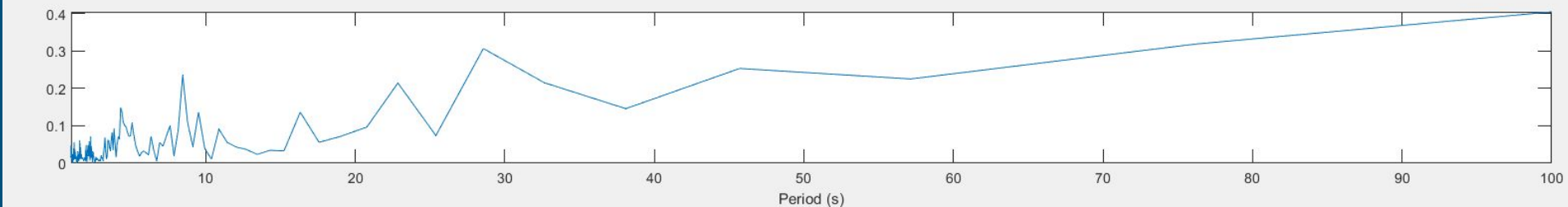
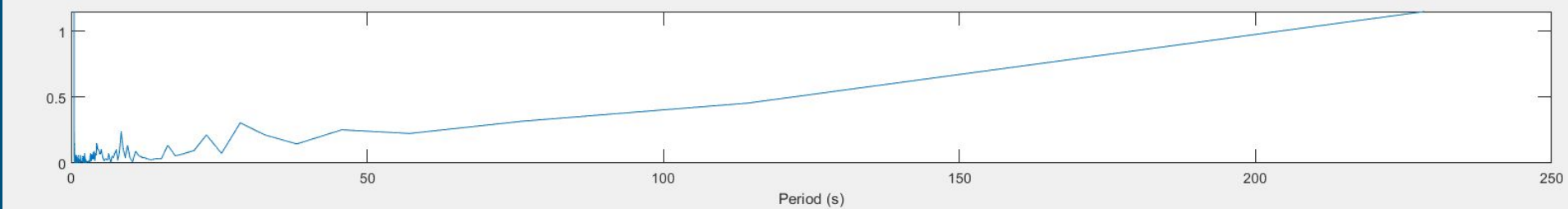
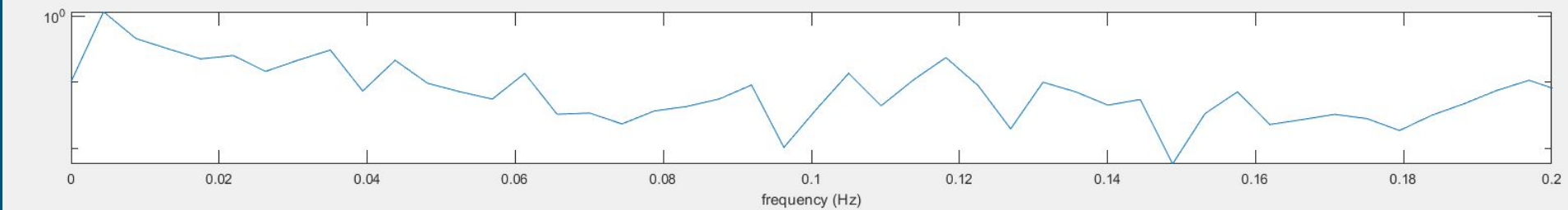
Std: 0.0052



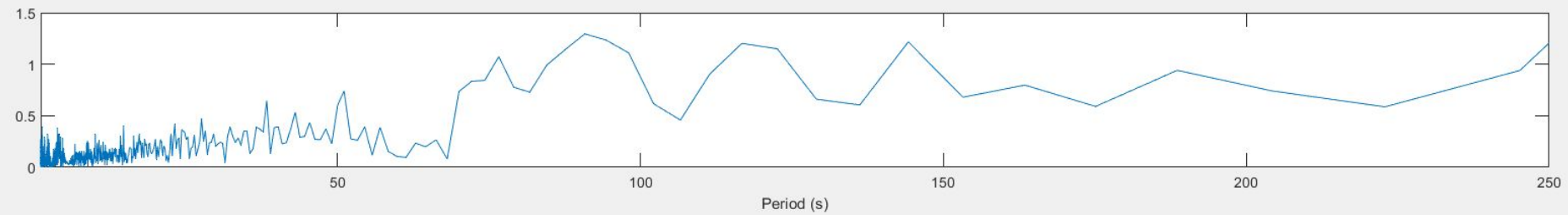
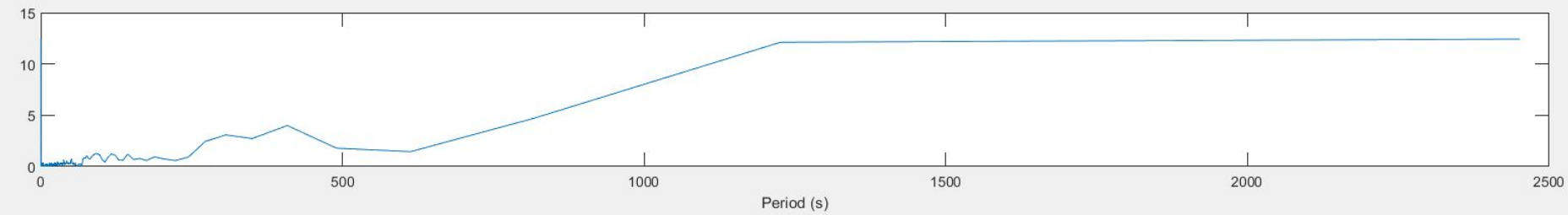
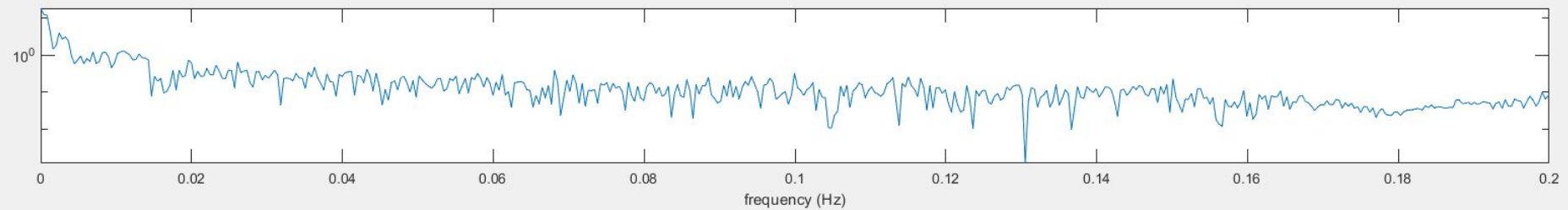
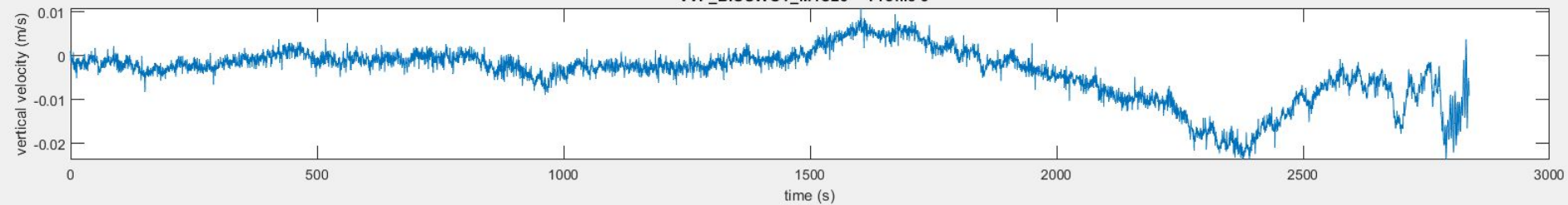
VVP_BIOSWOT_M1C23 **Profile 1**



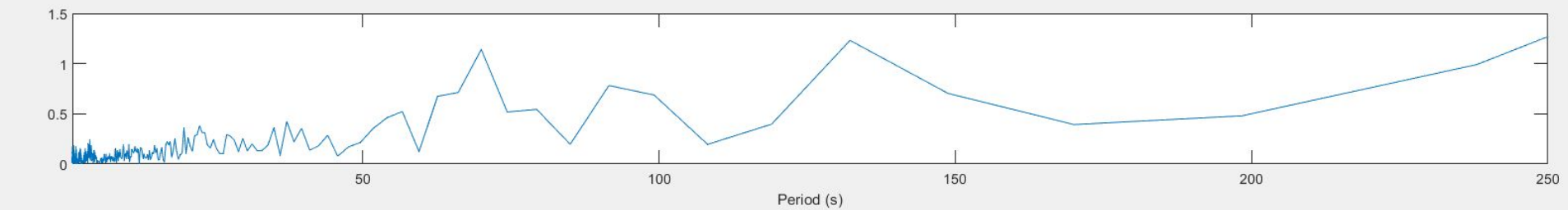
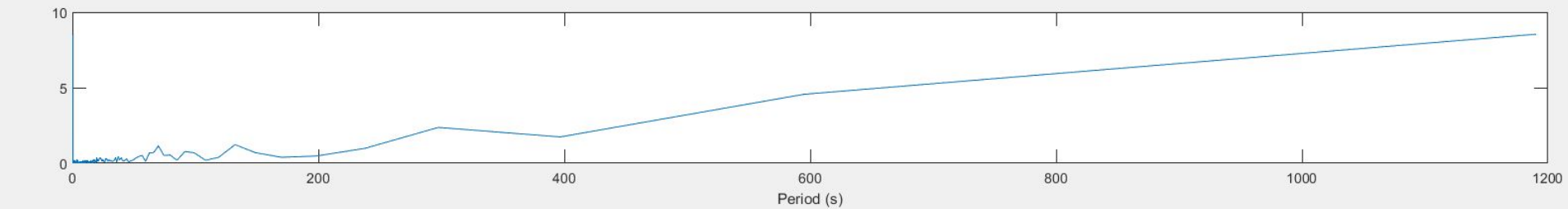
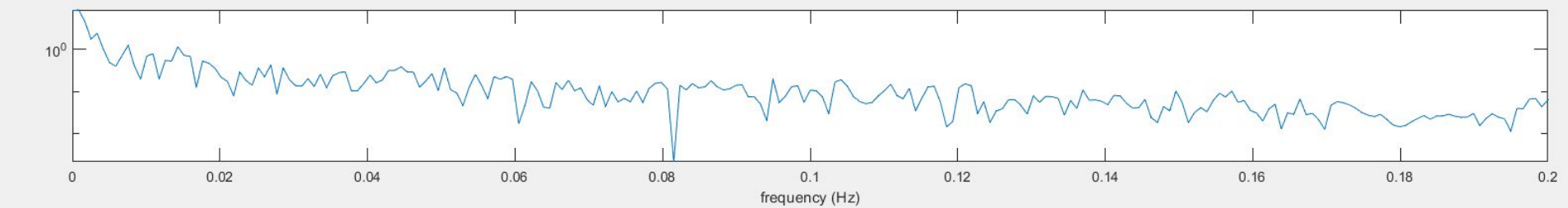
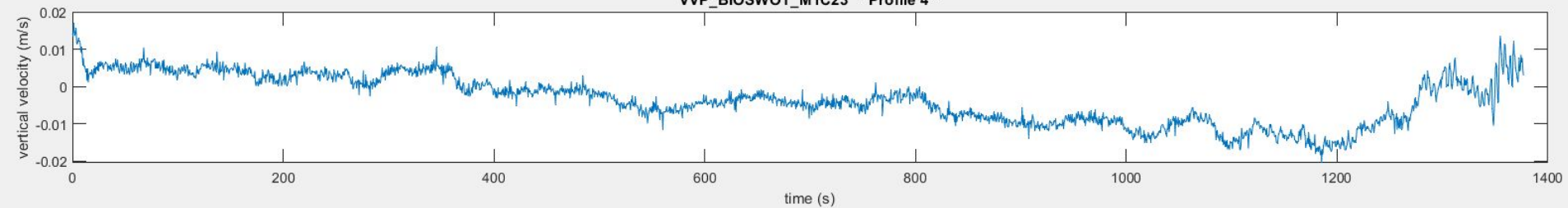
VVP_BIOSWOT_M1C23 **Profile 2**



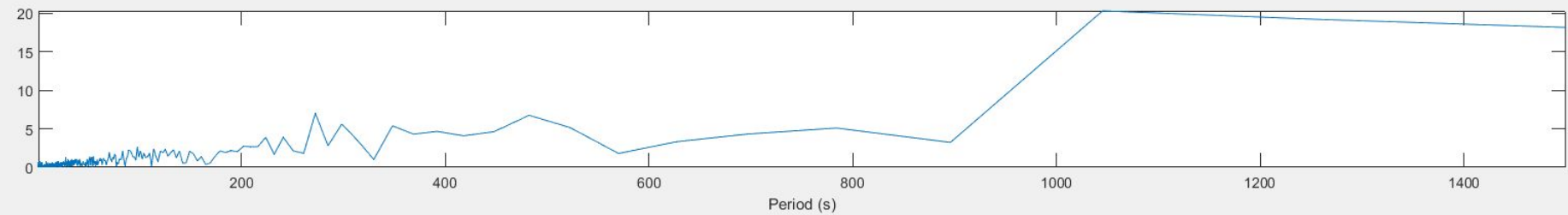
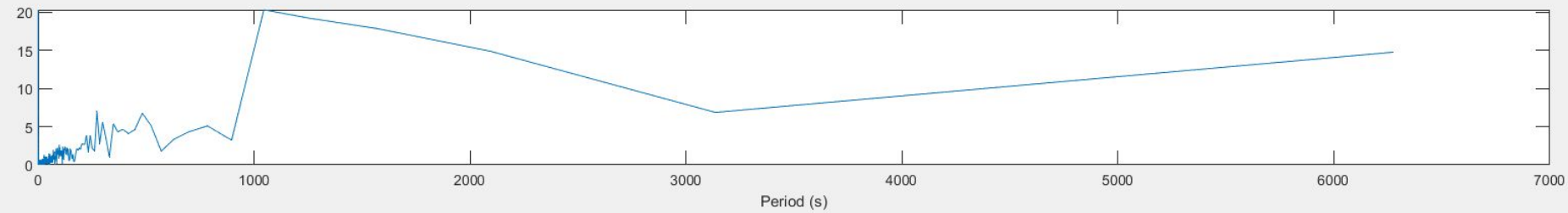
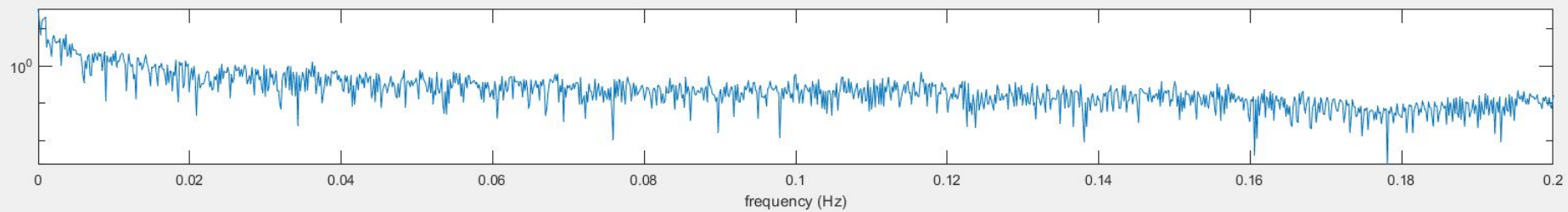
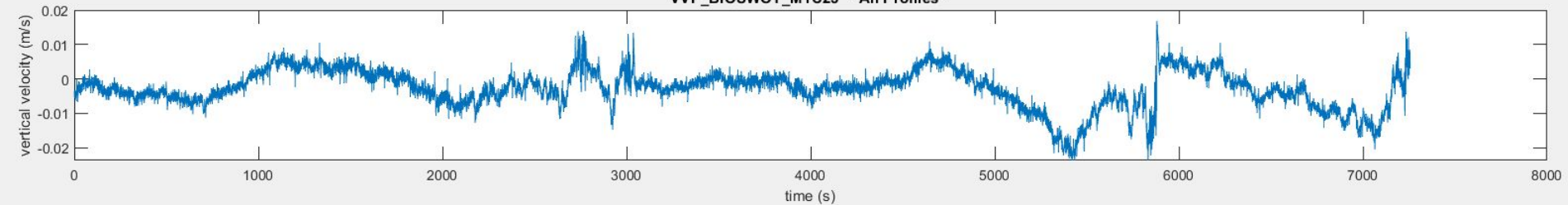
VVP_BIOSWOT_M1C23 **Profile 3**



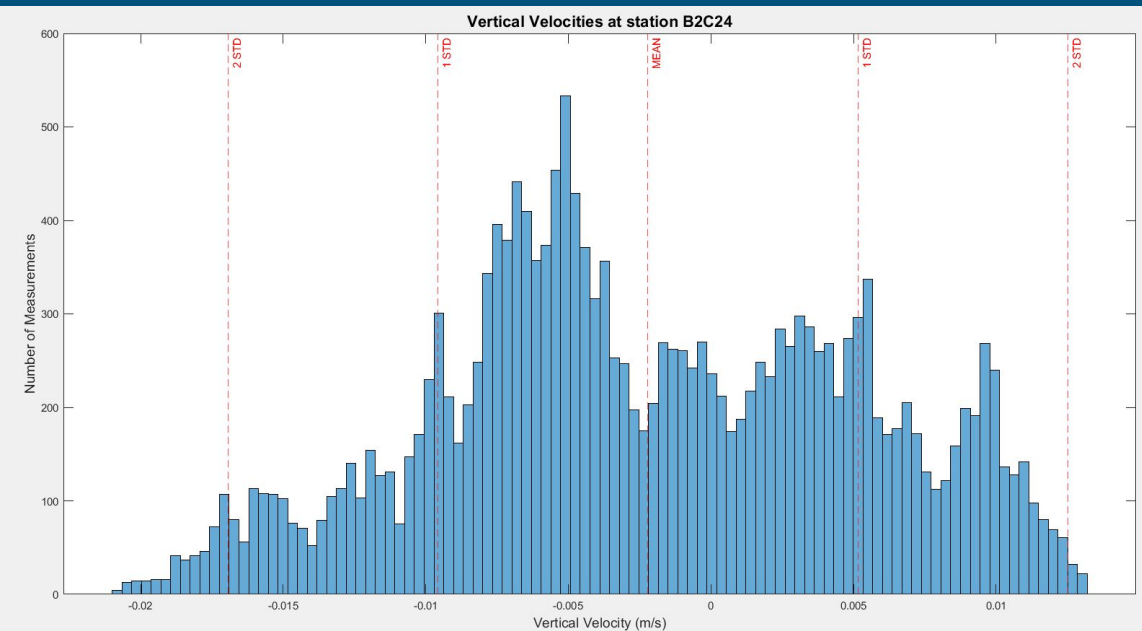
VVP_BIOSWOT_M1C23 **Profile 4**



VVP_BIOSWOT_M1C23 **All Profiles**

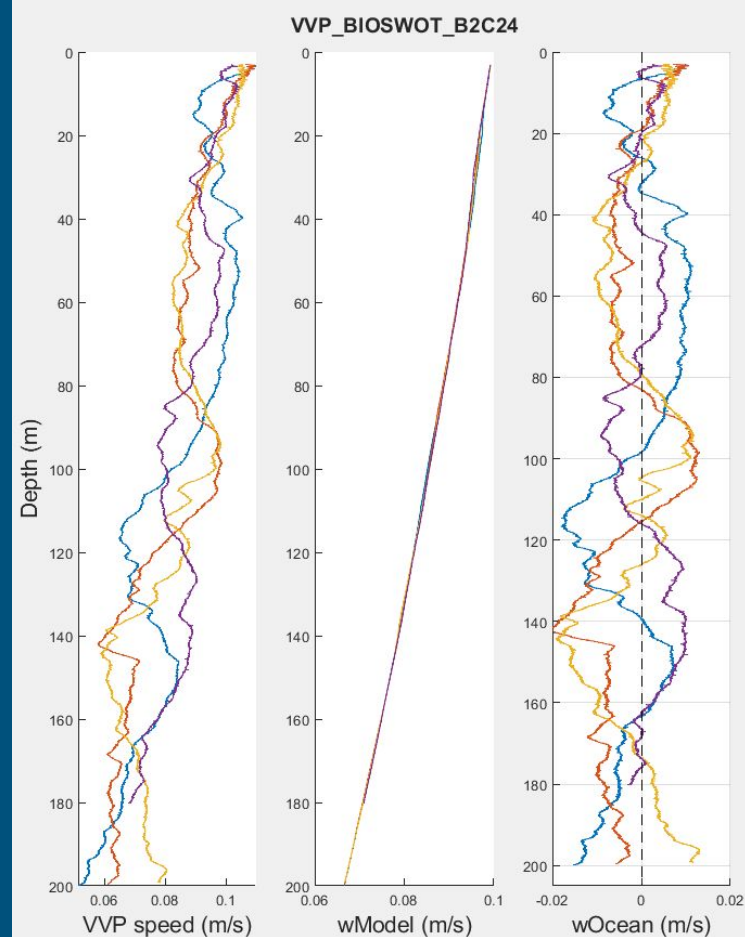


Station B2C24

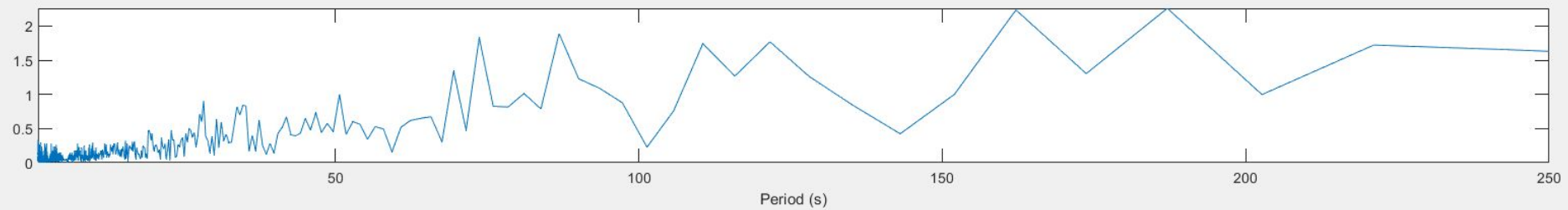
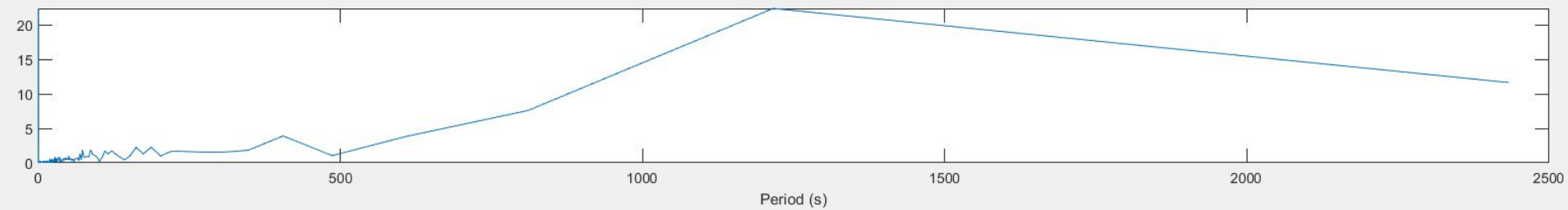
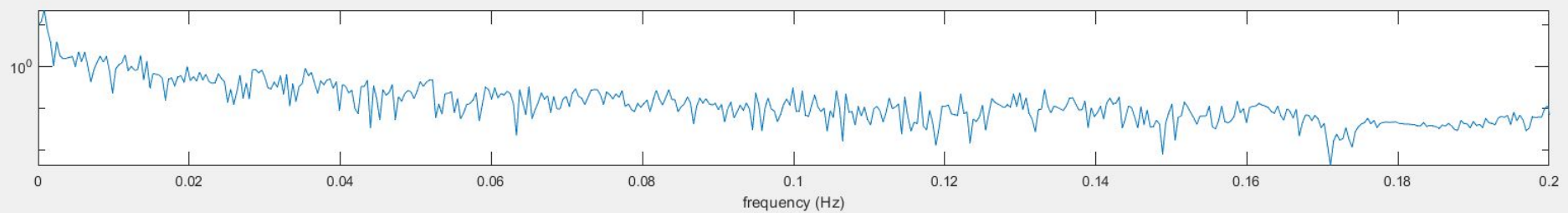
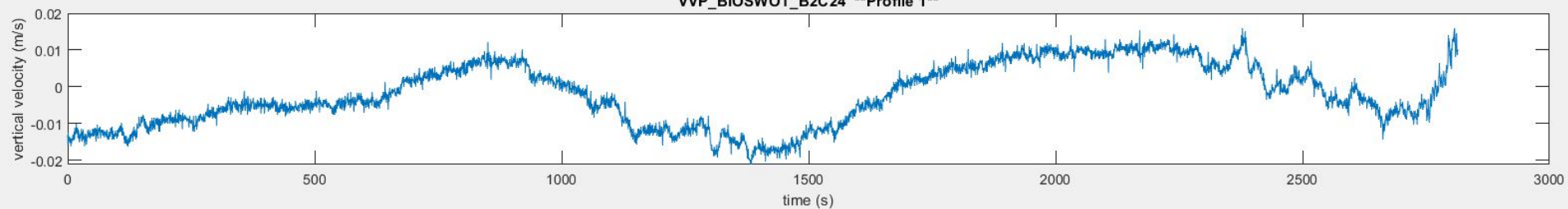


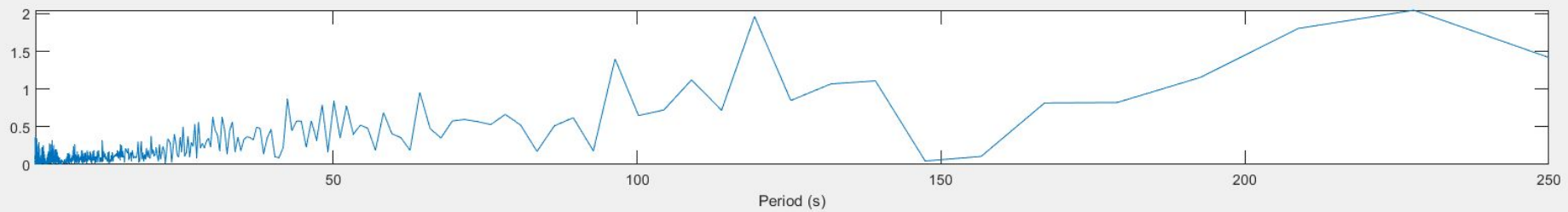
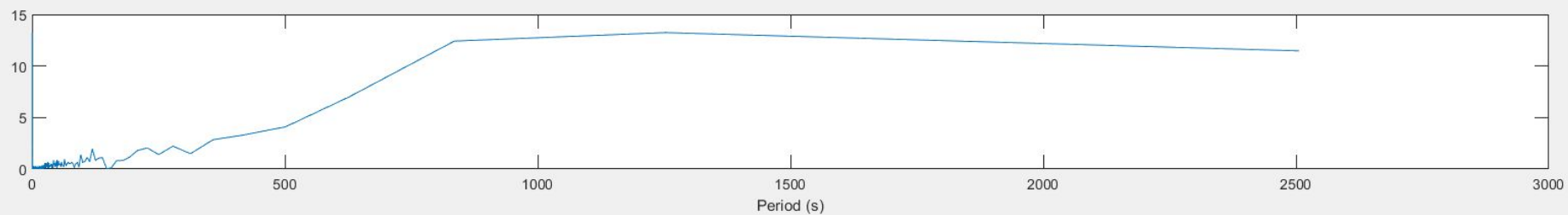
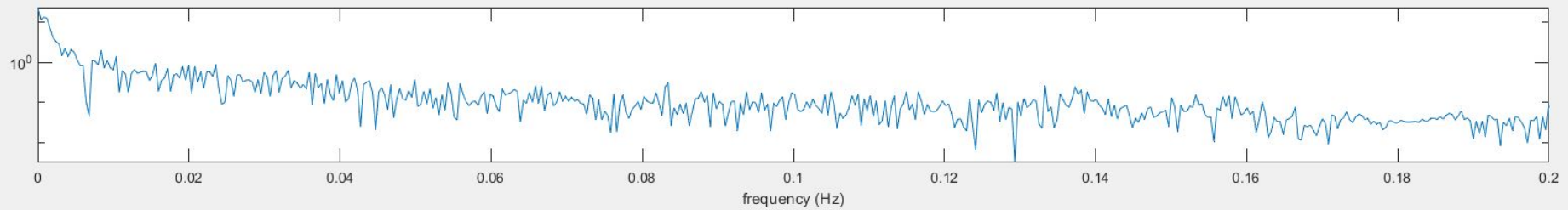
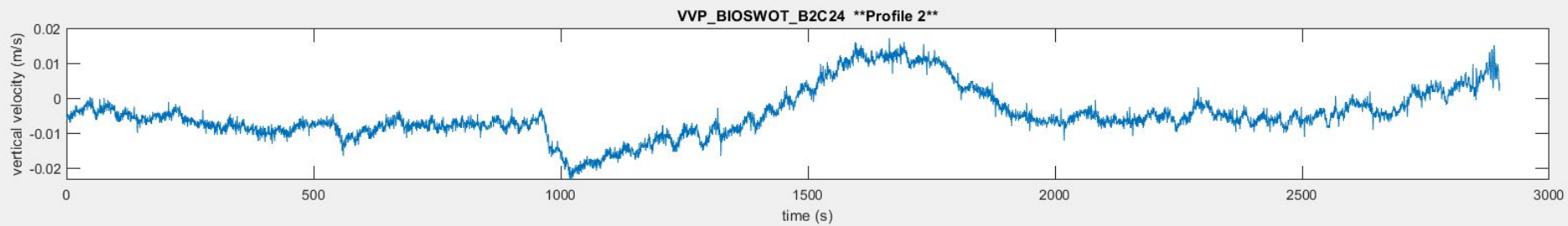
Mean: -0.0022 m/s

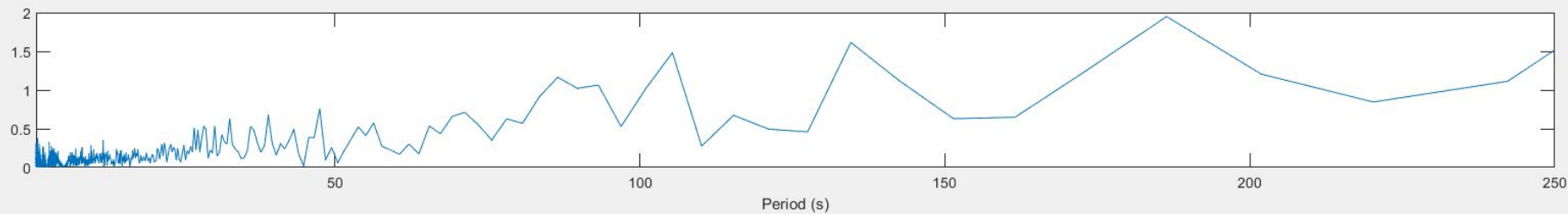
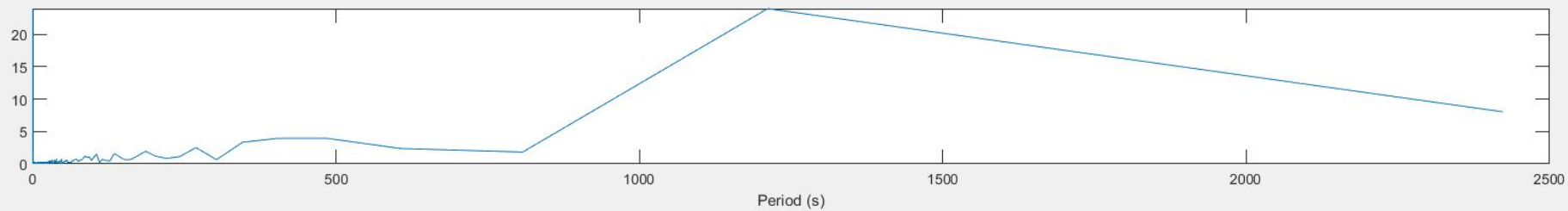
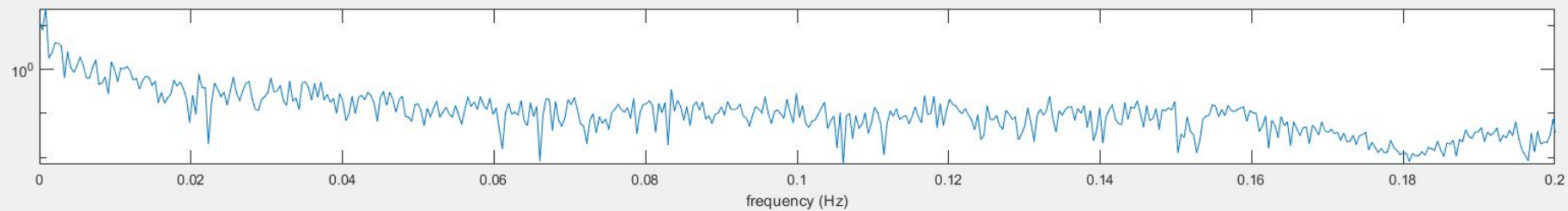
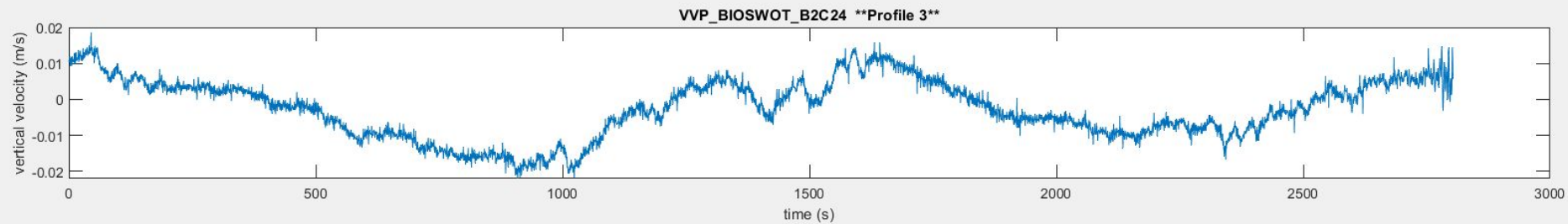
Std: 0.0074

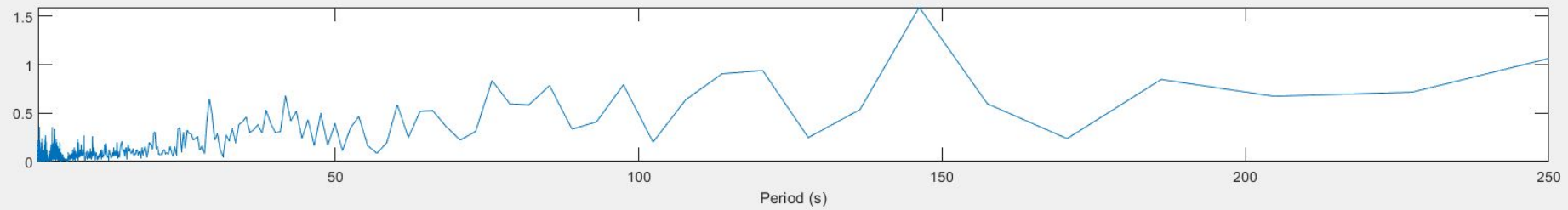
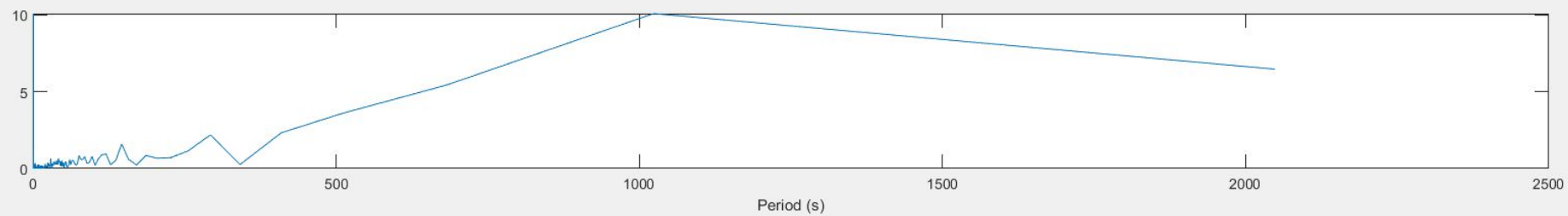
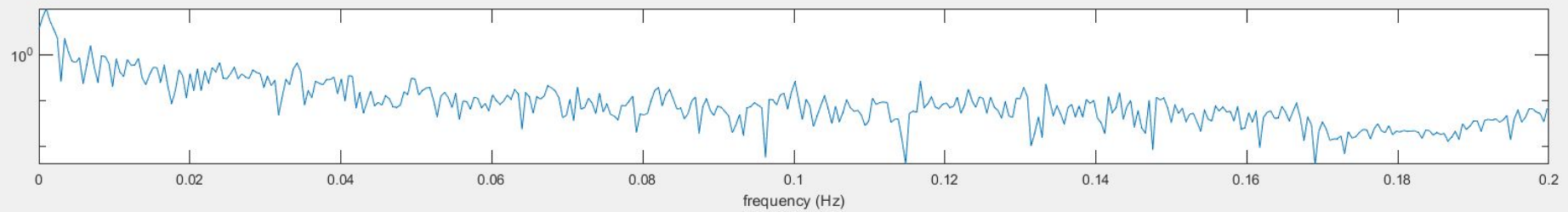
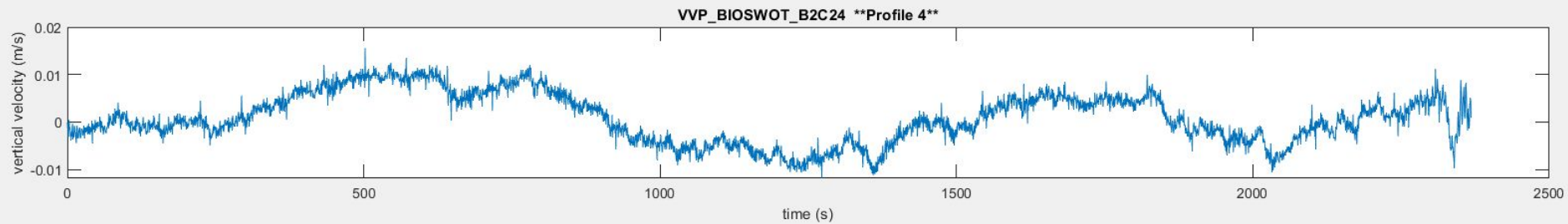


VVP_BIOSWOT_B2C24 **Profile 1**

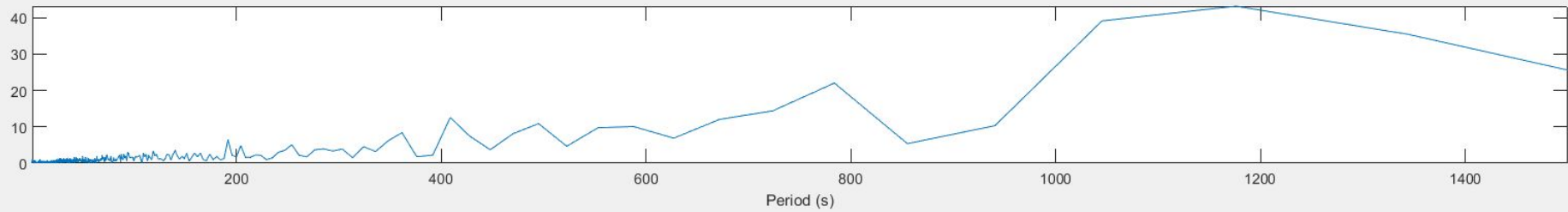
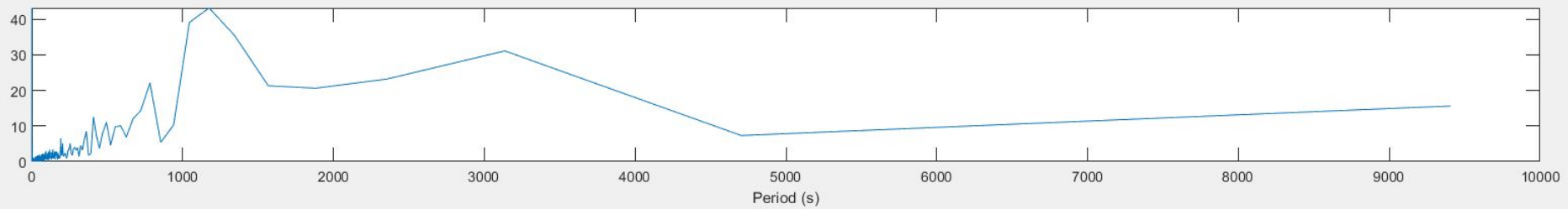
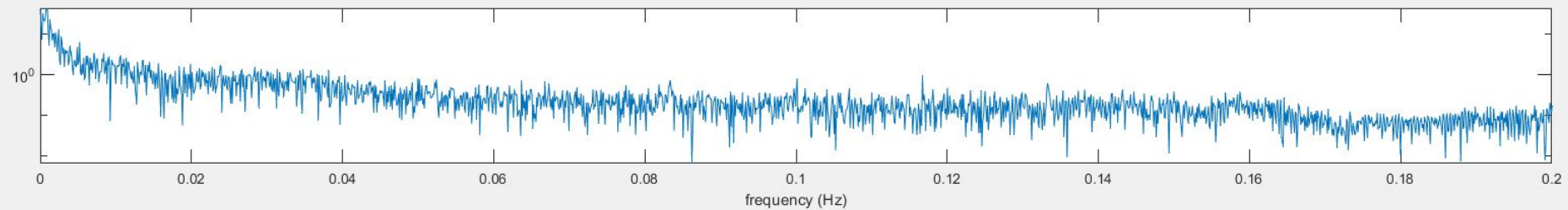
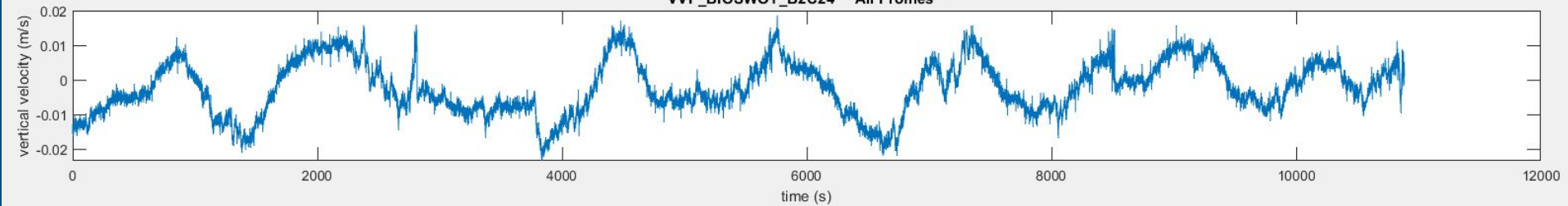




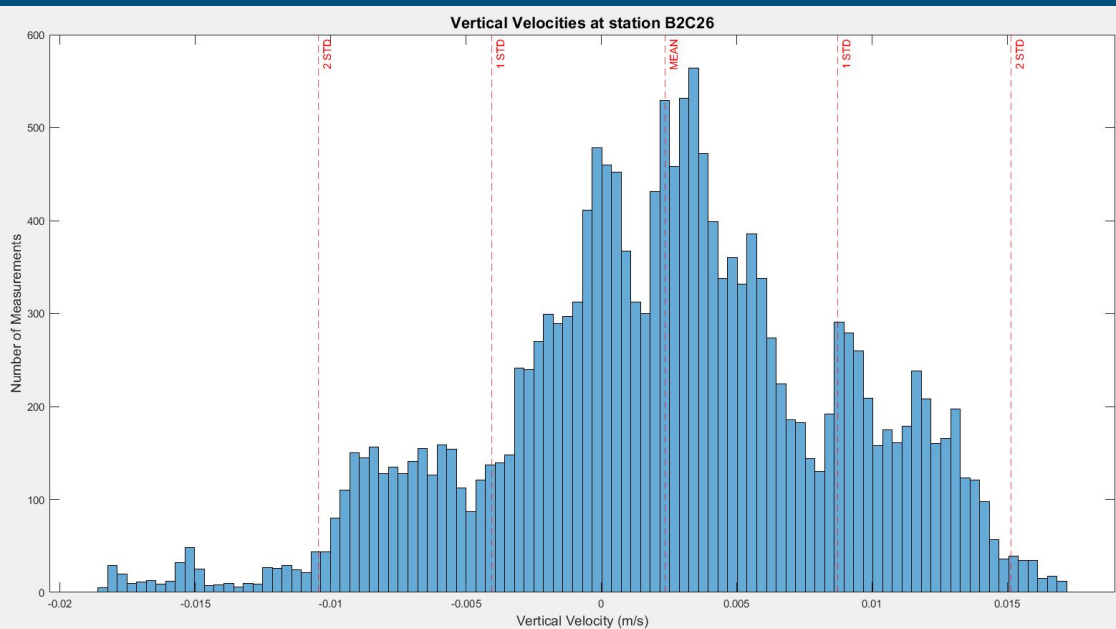




VVP_BIOSWOT_B2C24 **All Profiles**

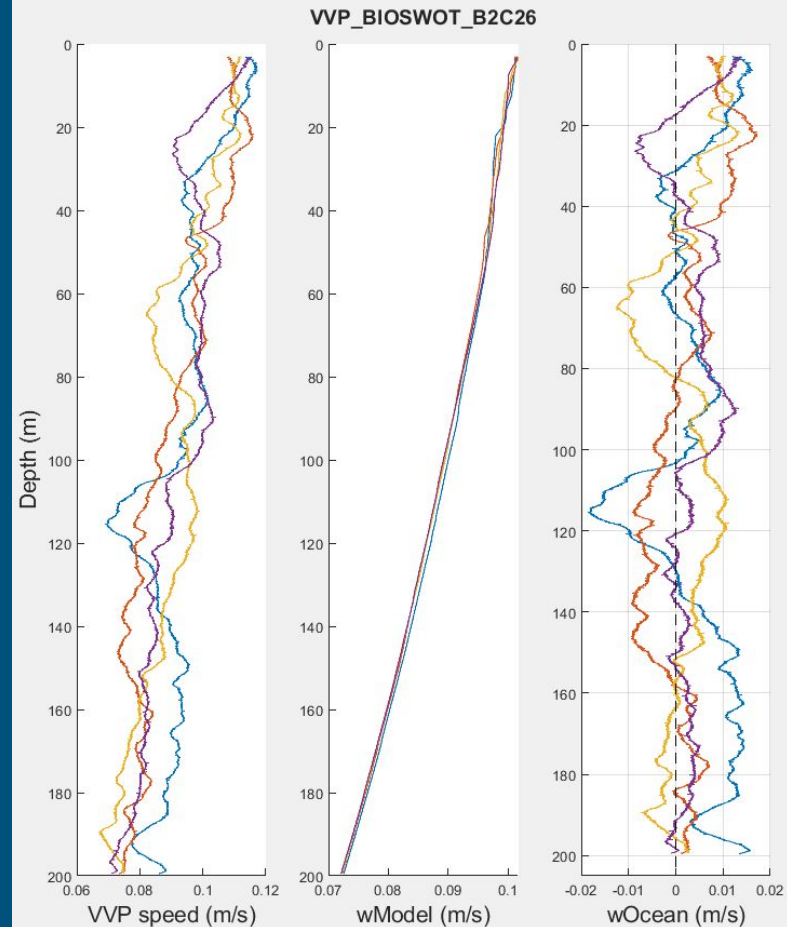


Station B2C26

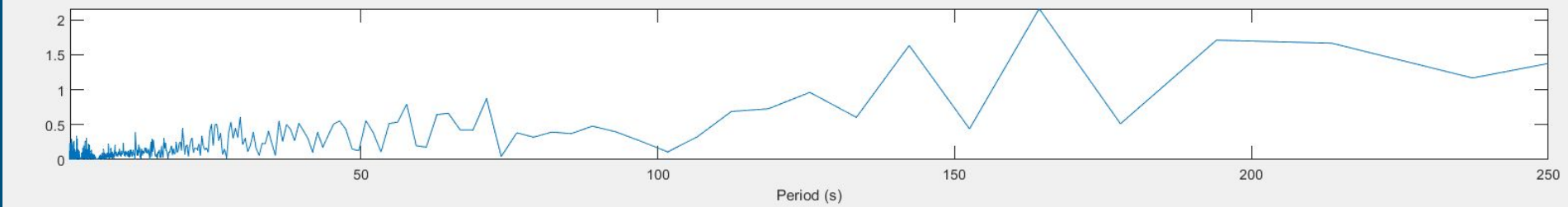
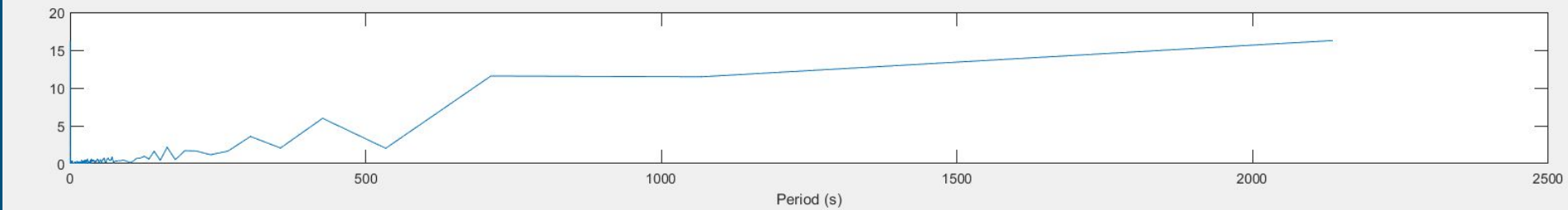
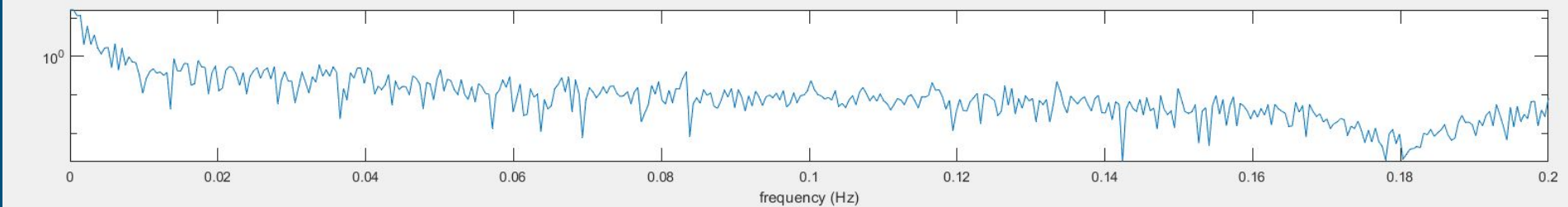


Mean: 0.0023 m/s

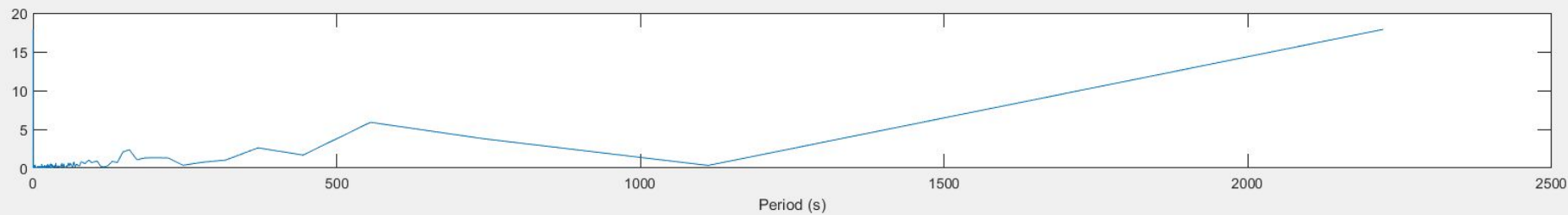
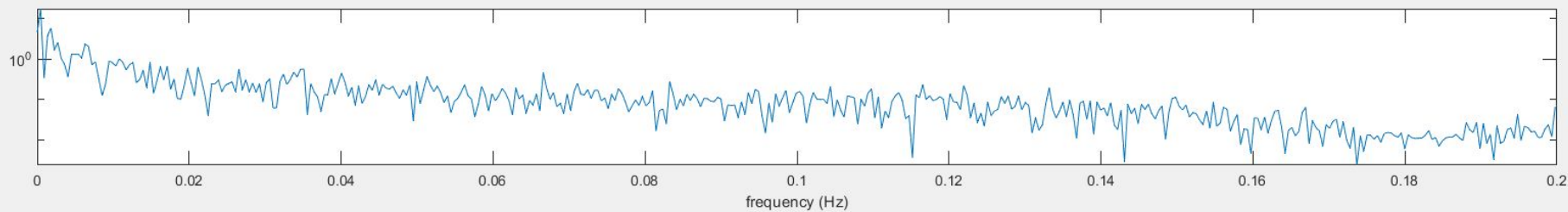
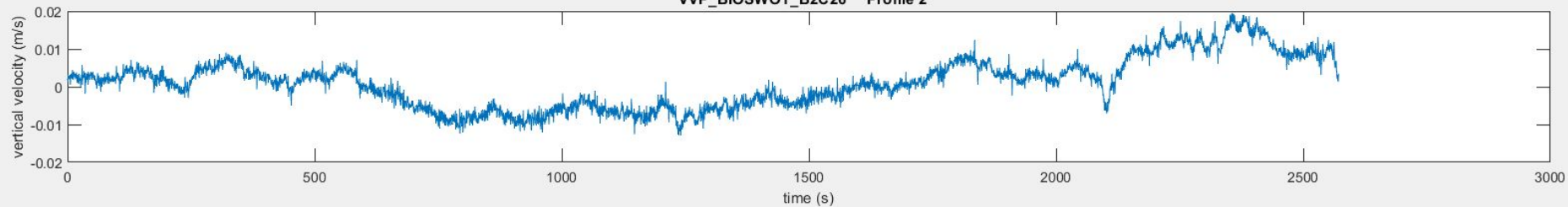
Std: 0.0064



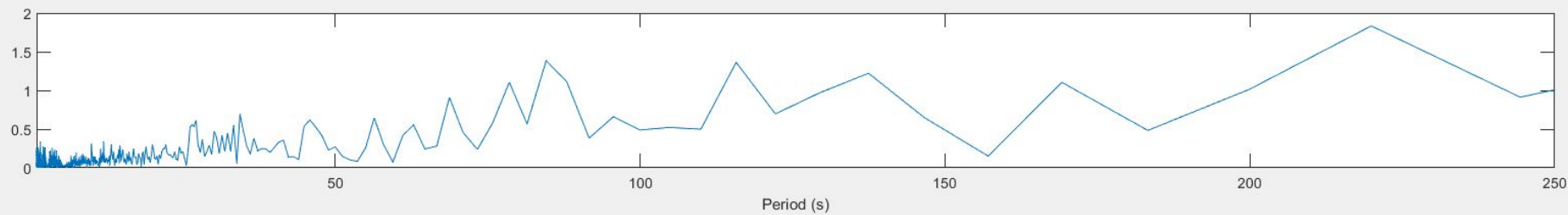
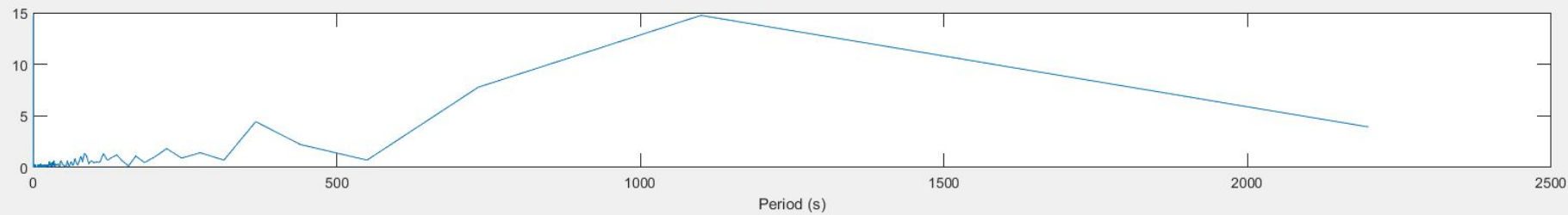
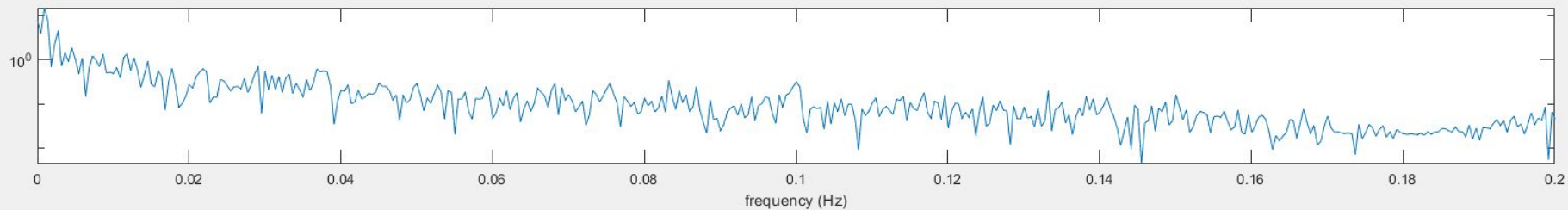
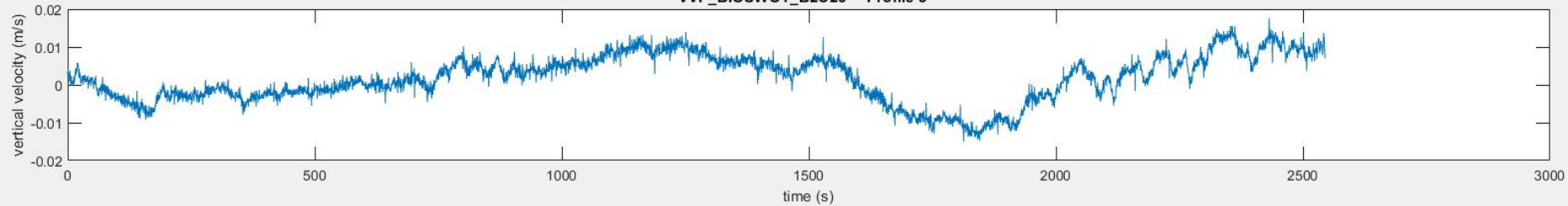
VVP_BIOSWOT_B2C26 **Profile 1**

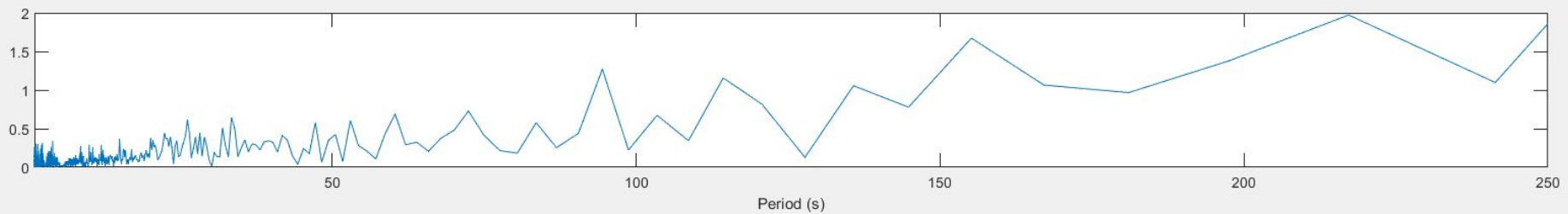
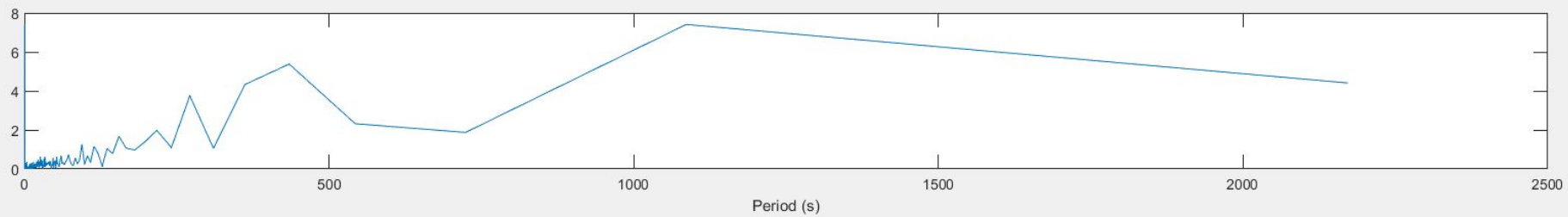
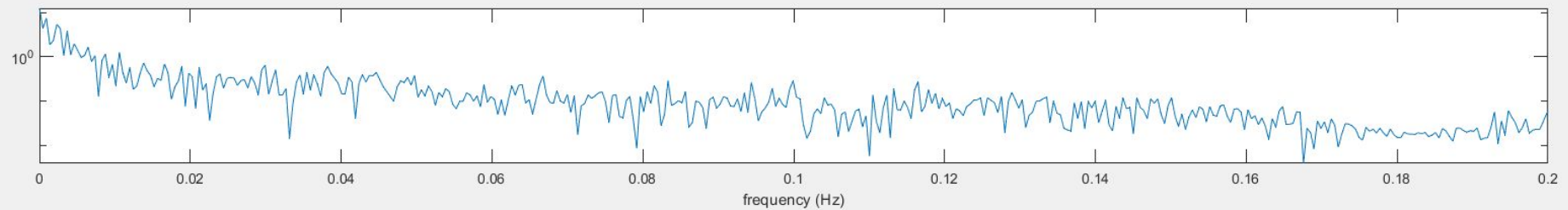
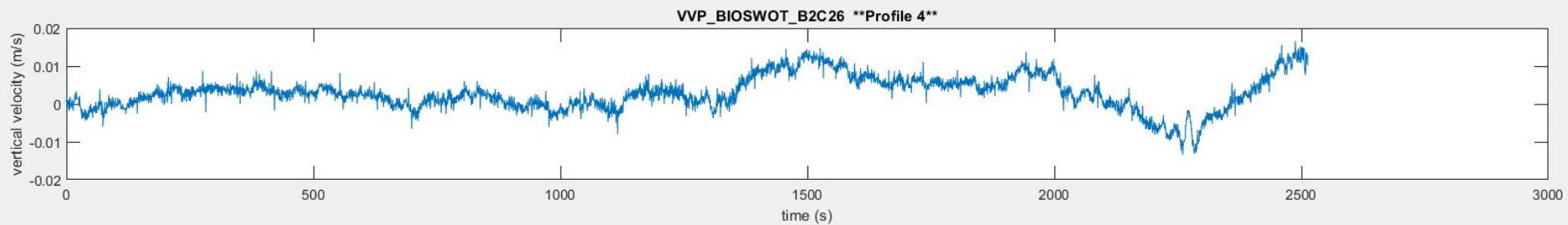


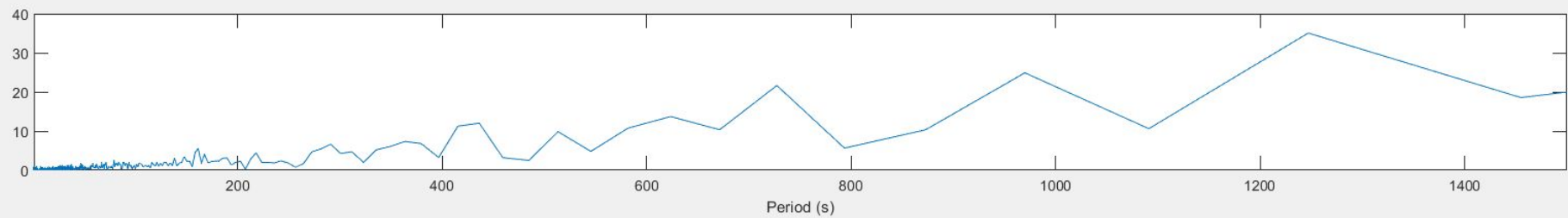
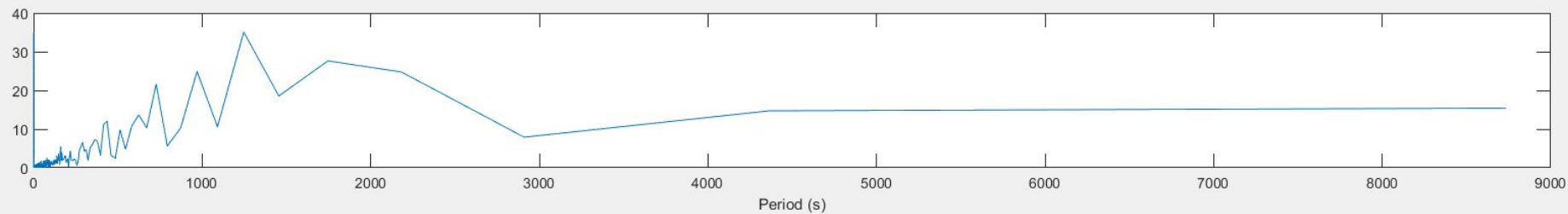
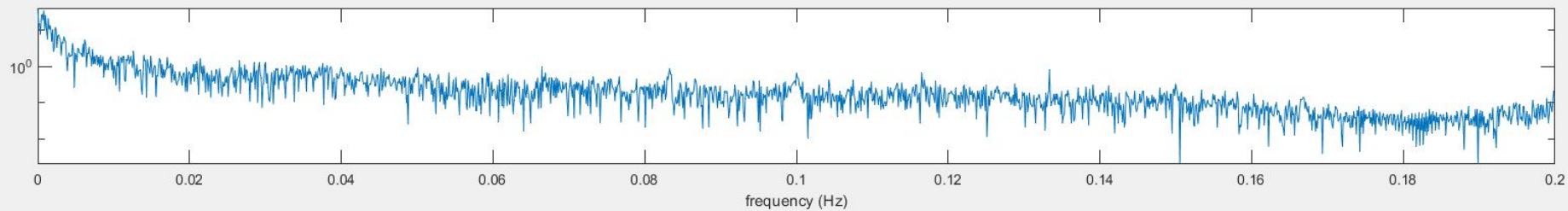
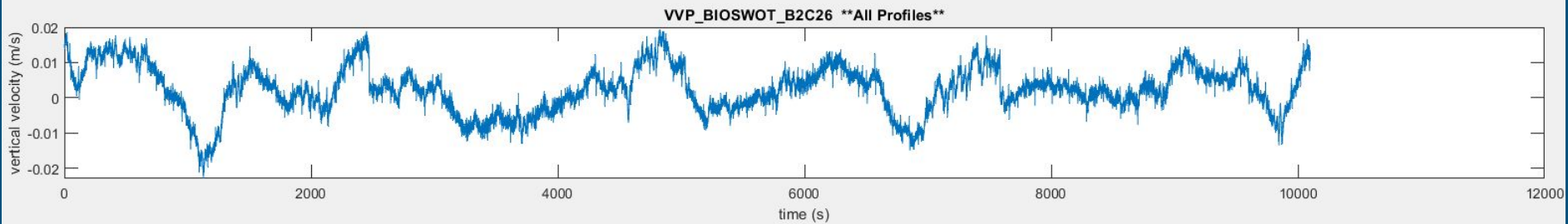
VVP_BIOSWOT_B2C26 **Profile 2**



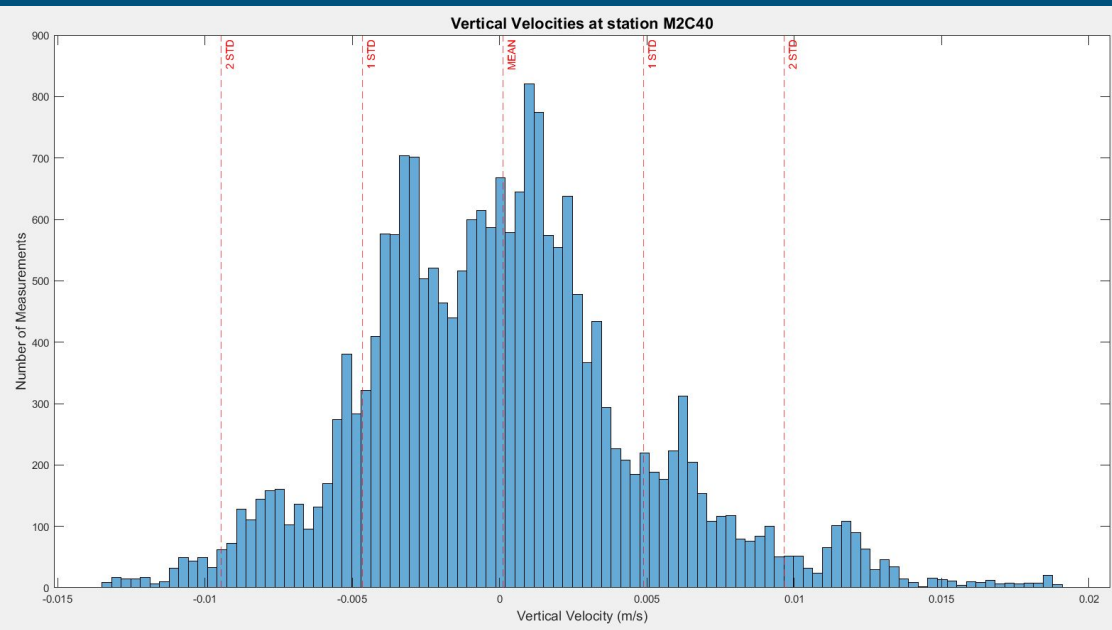
VVP_BIOSWOT_B2C26 **Profile 3**





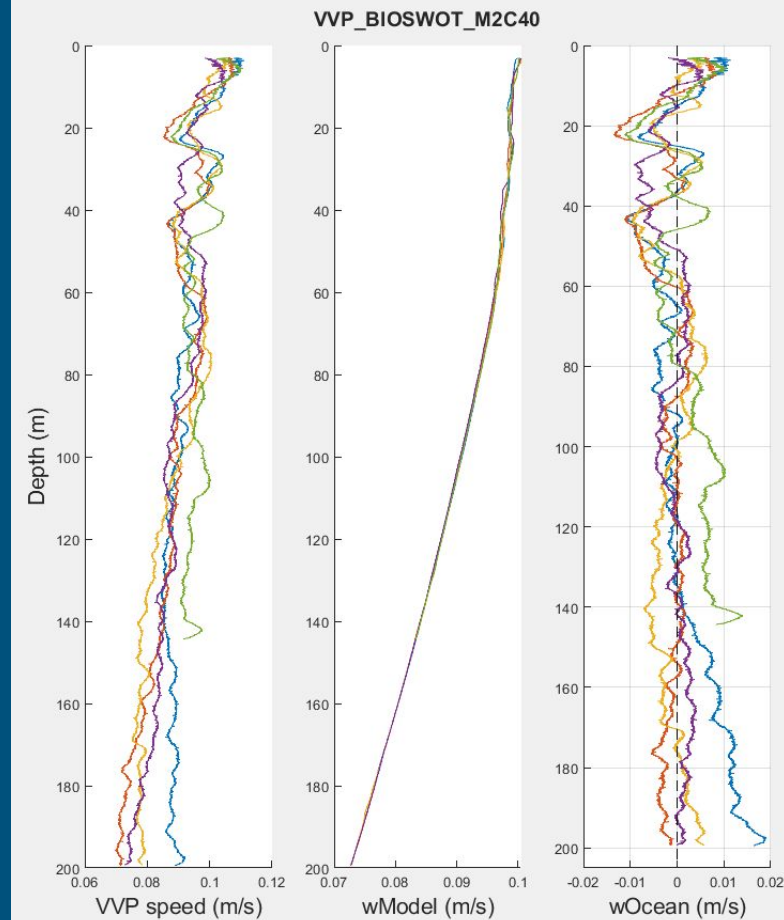


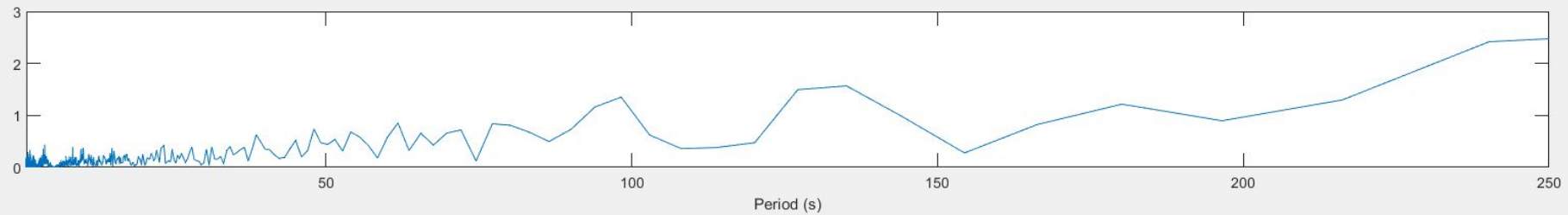
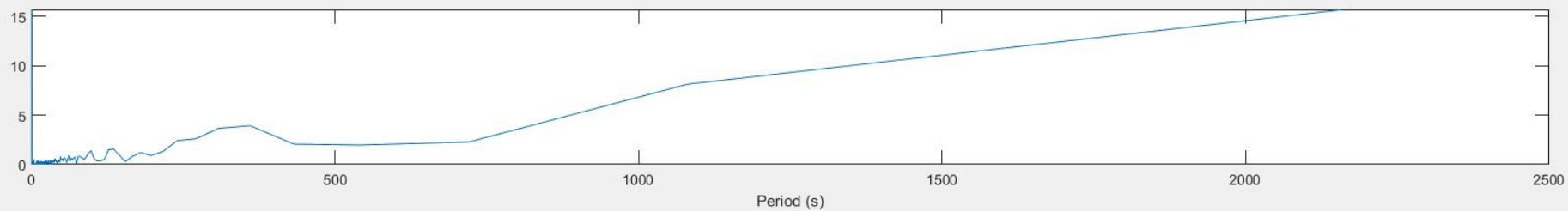
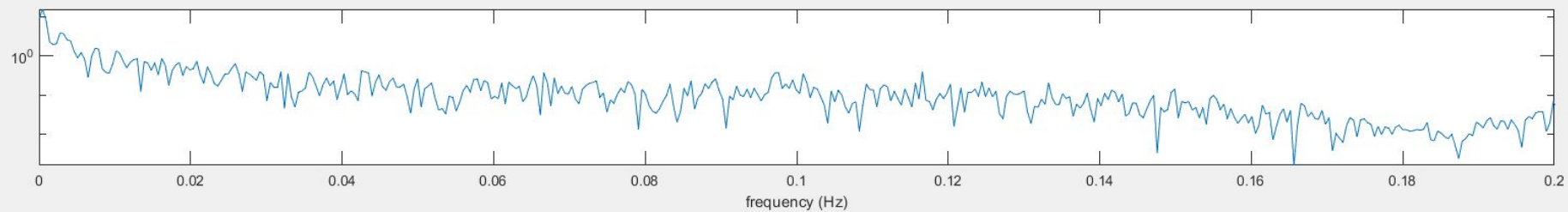
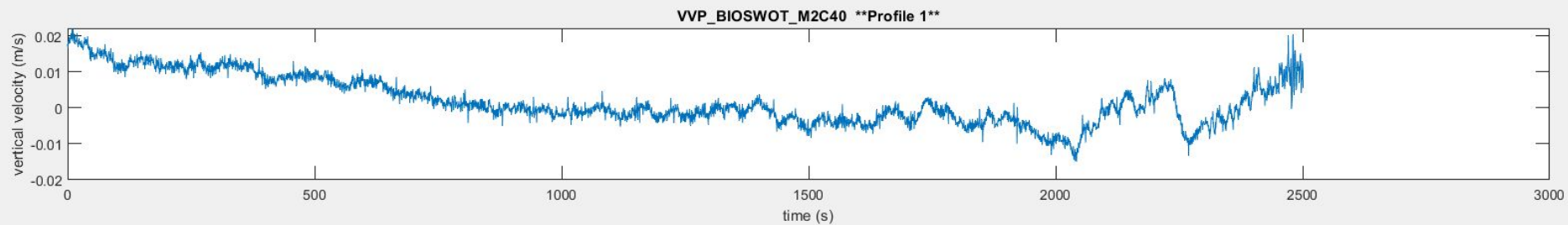
Station M2C40

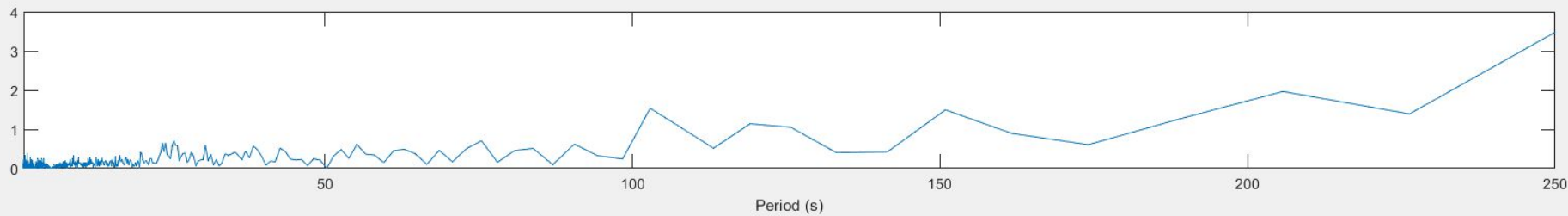
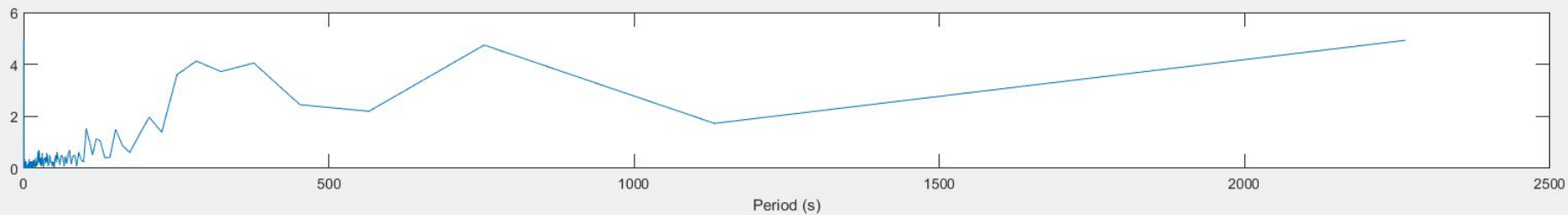
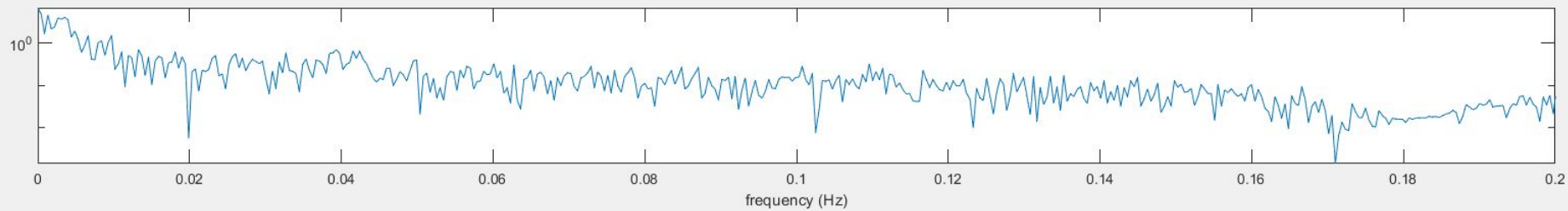
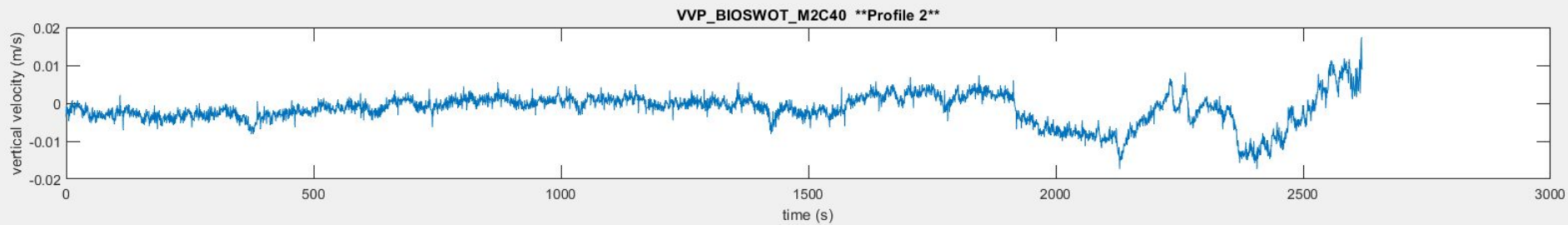


Mean: 0.0001 m/s

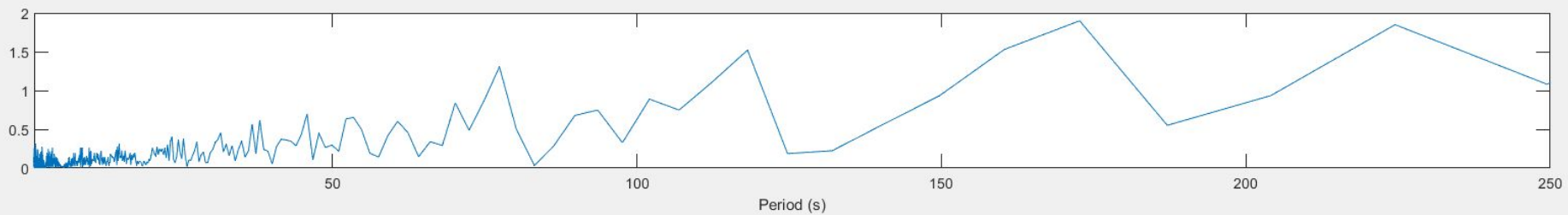
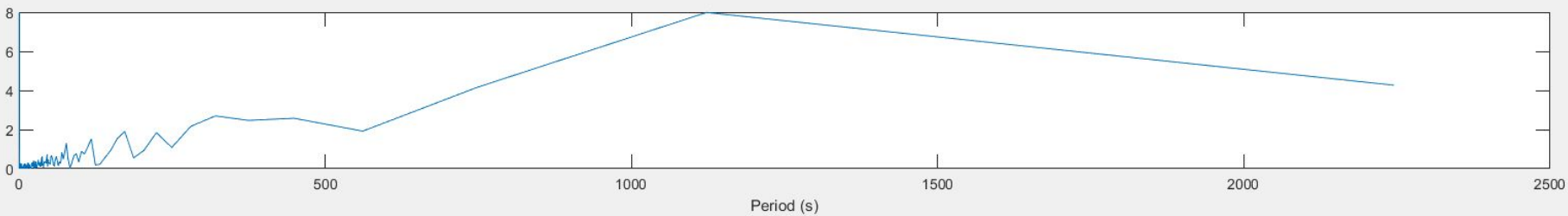
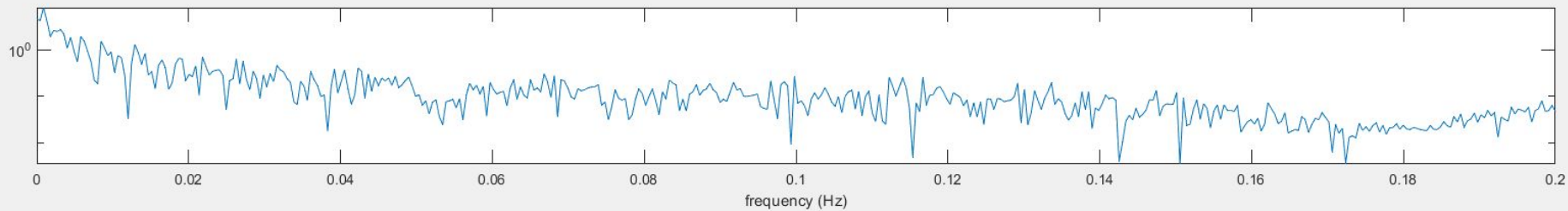
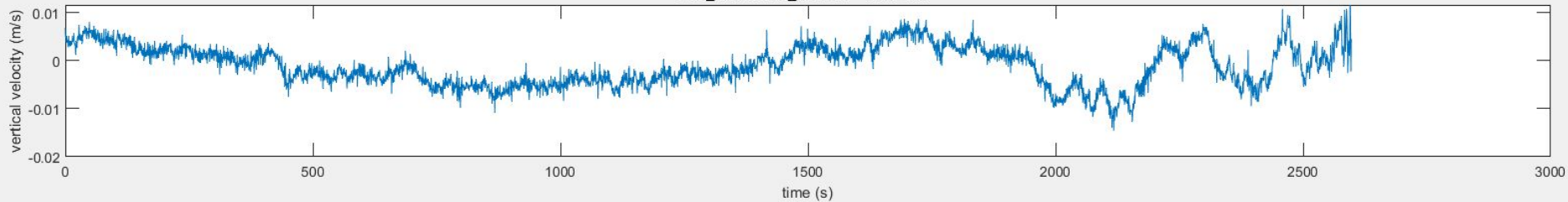
Std: 0.0048



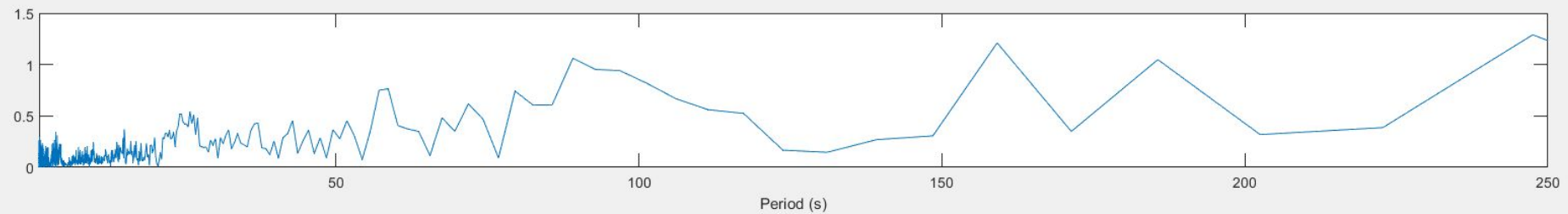
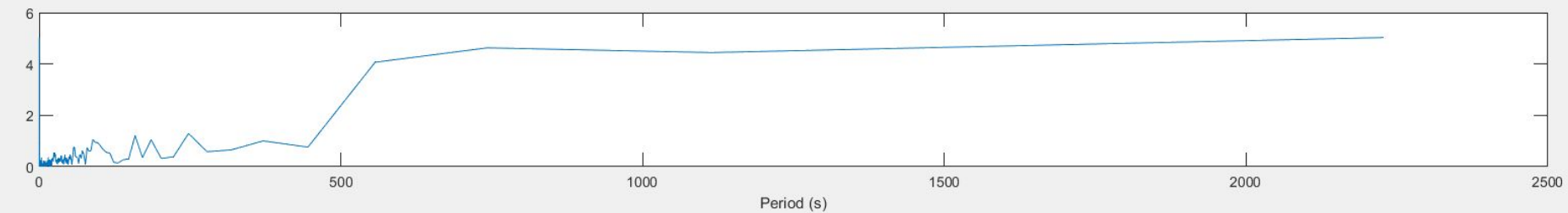
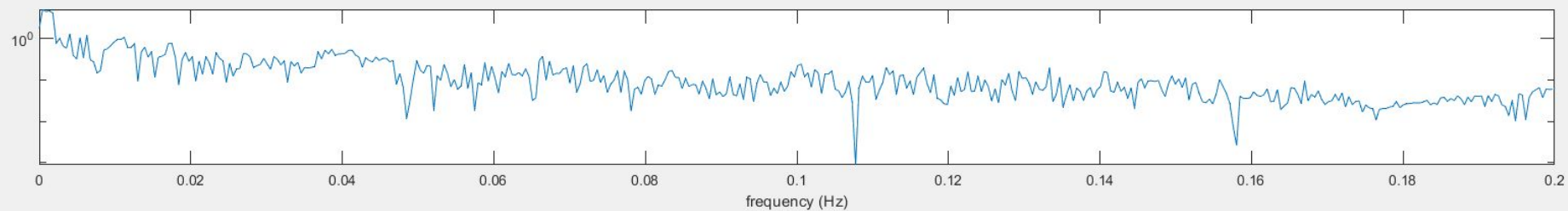
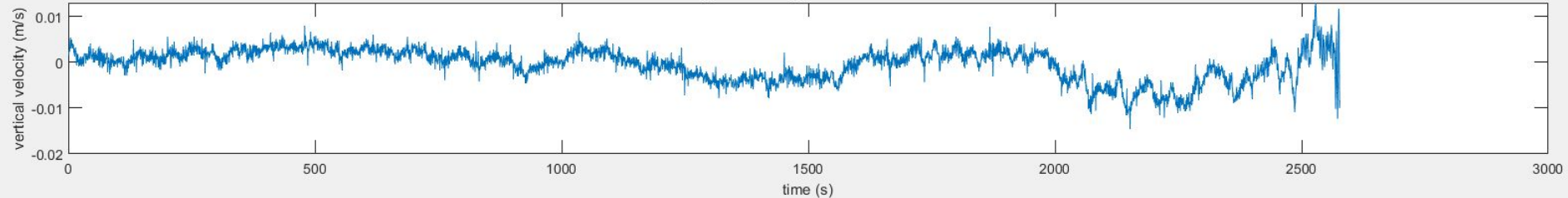


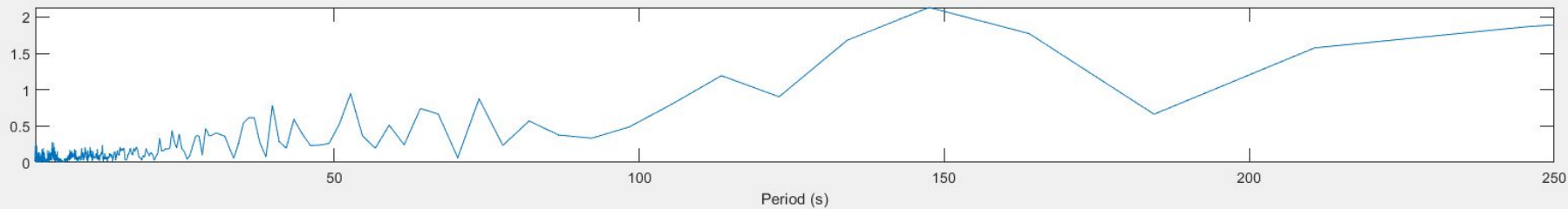
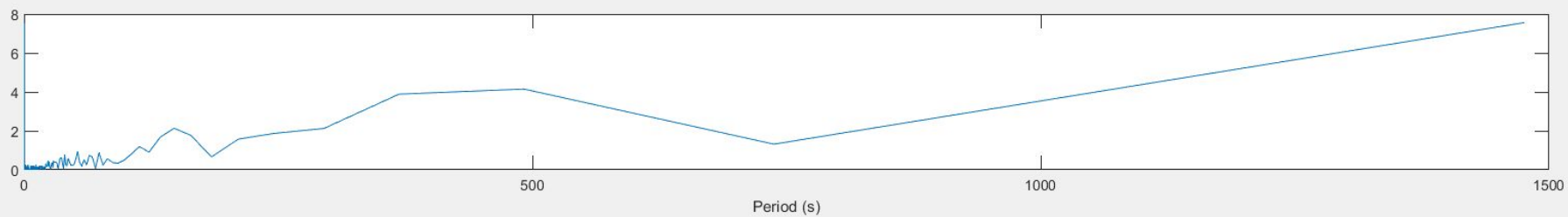
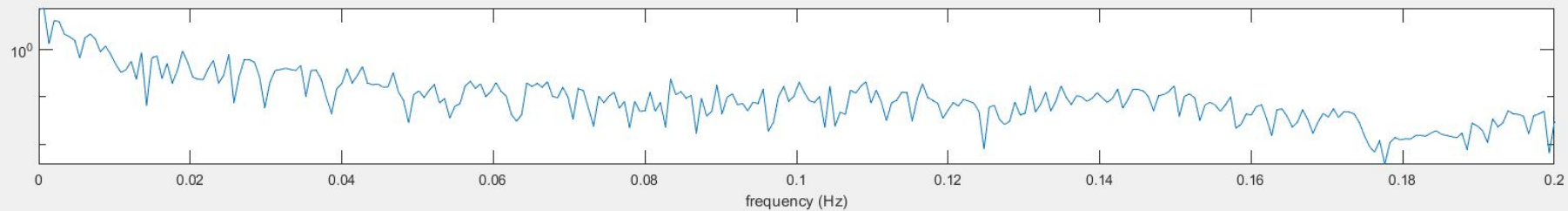
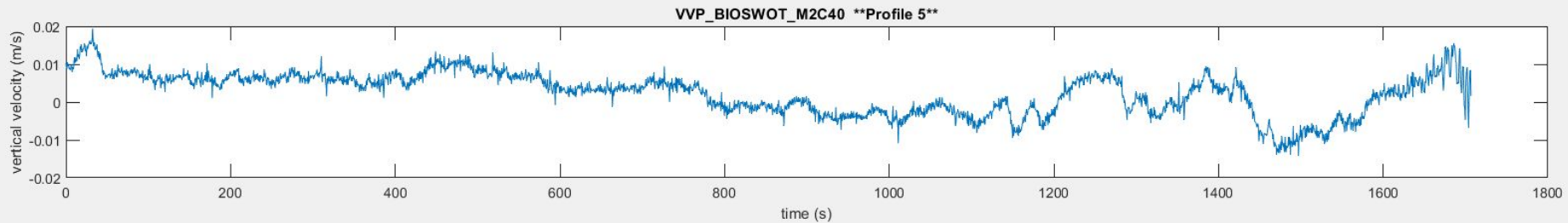


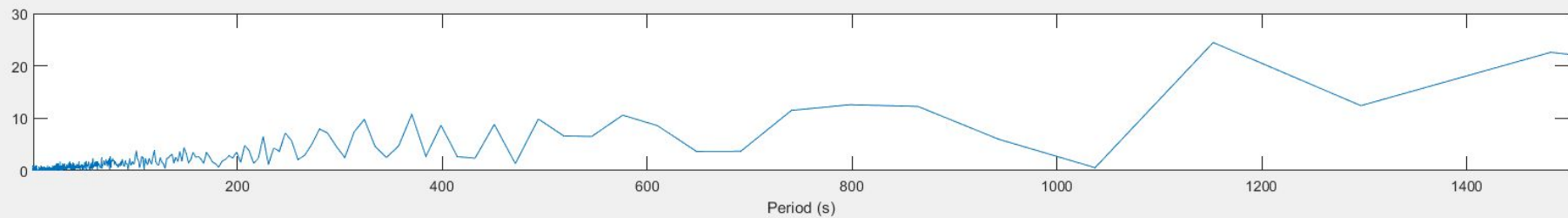
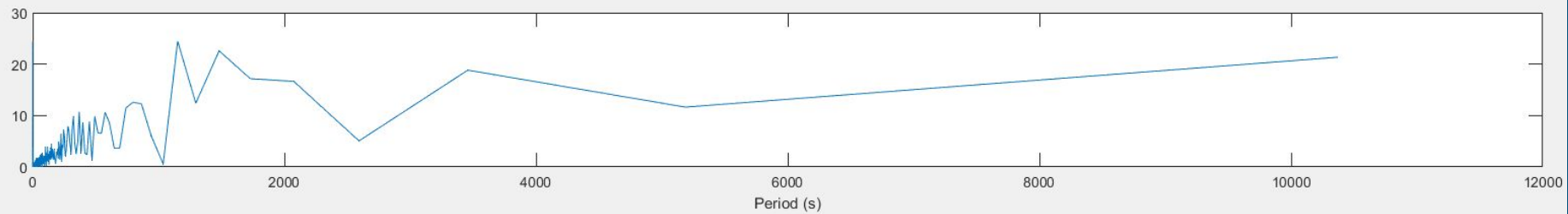
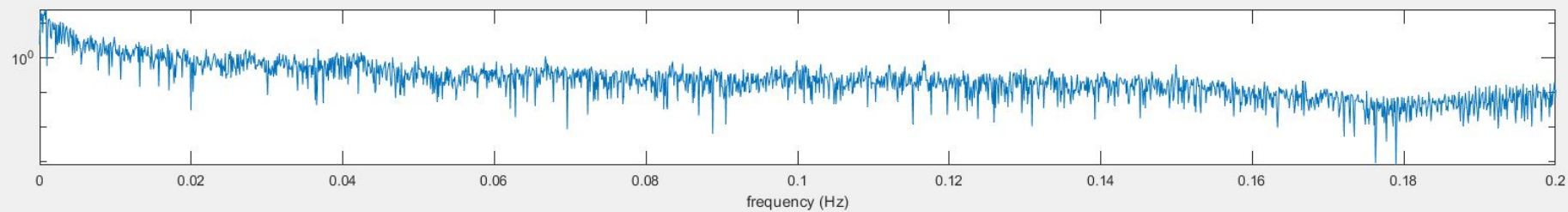
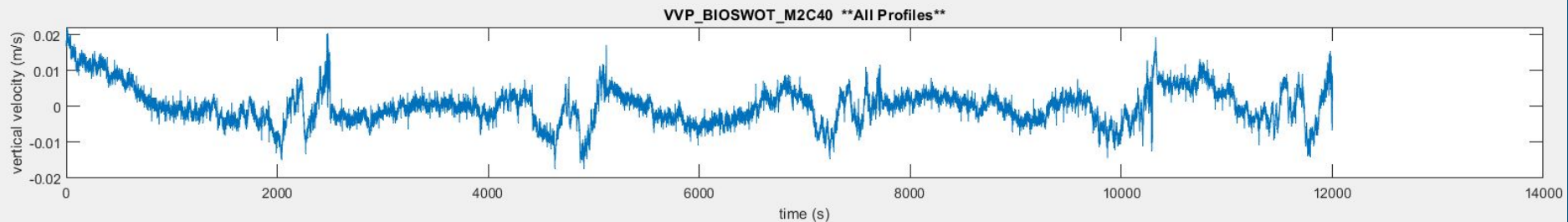
VVP_BIOSWOT_M2C40 **Profile 3**



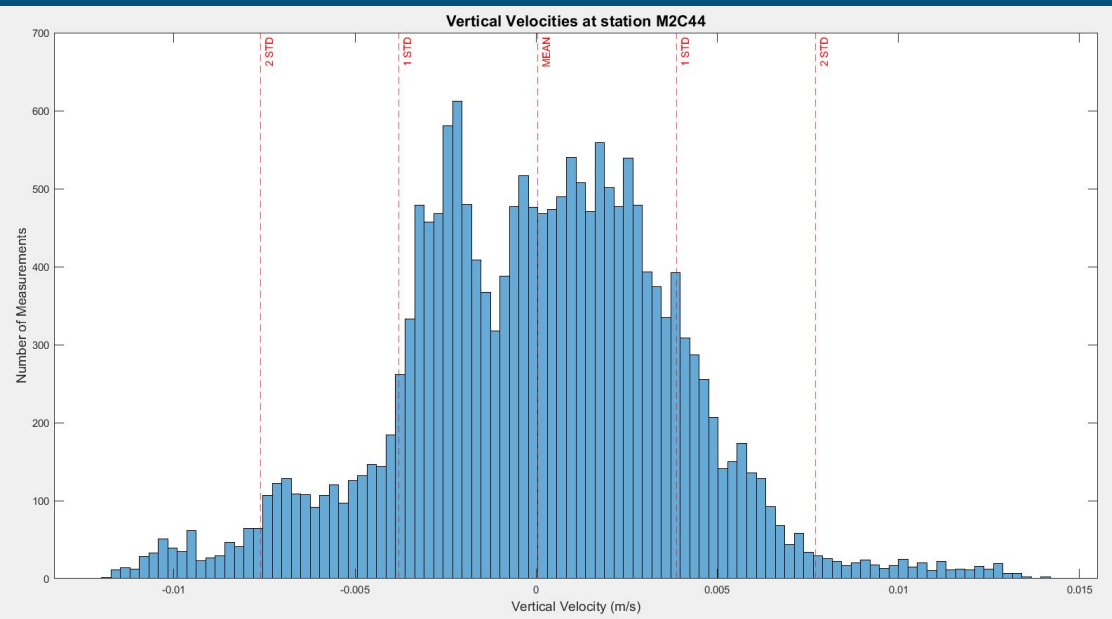
VVP_BIOSWOT_M2C40 **Profile 4**





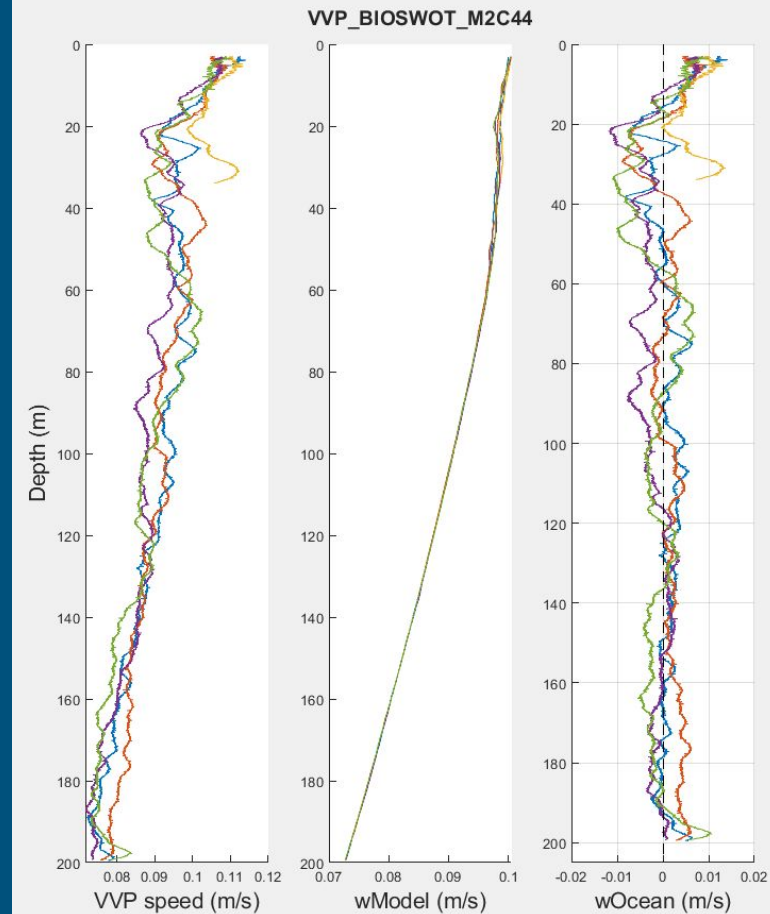


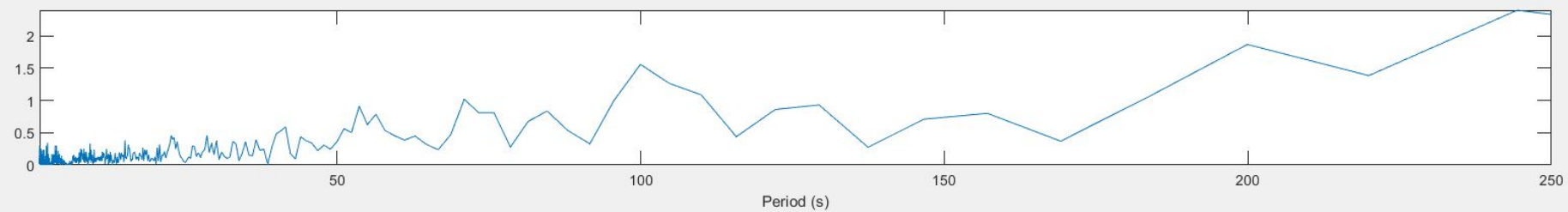
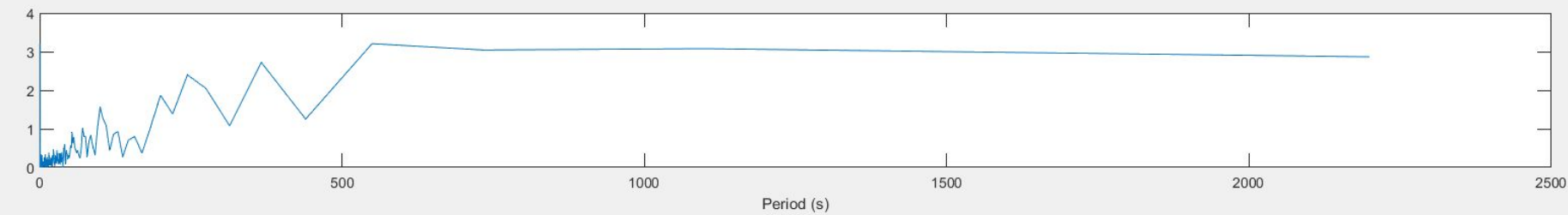
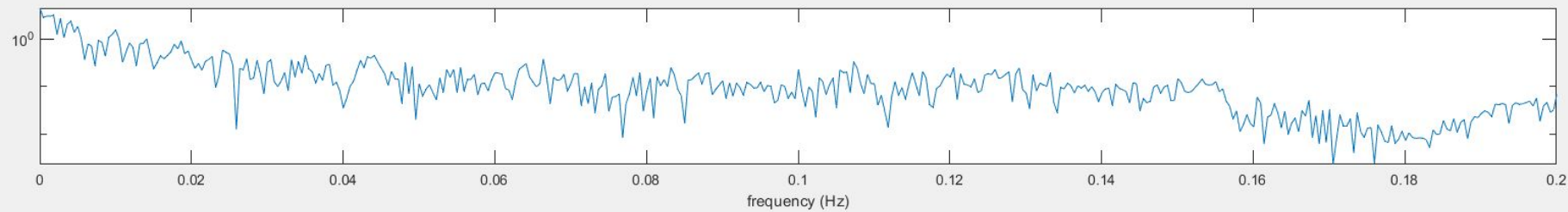
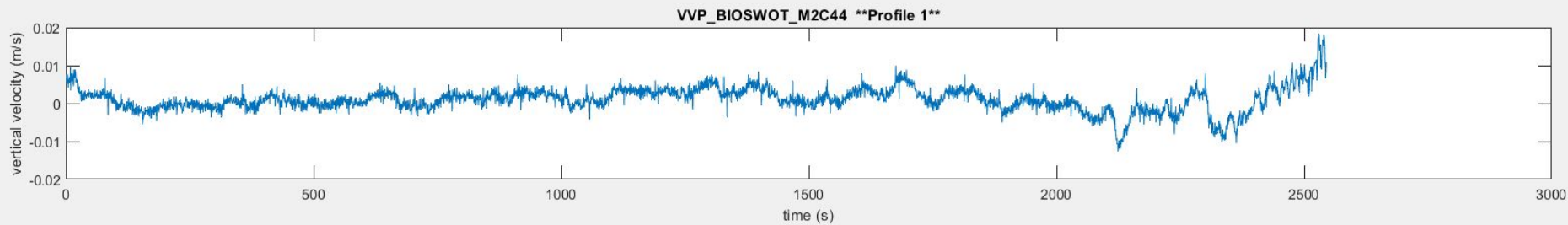
Station M2C44



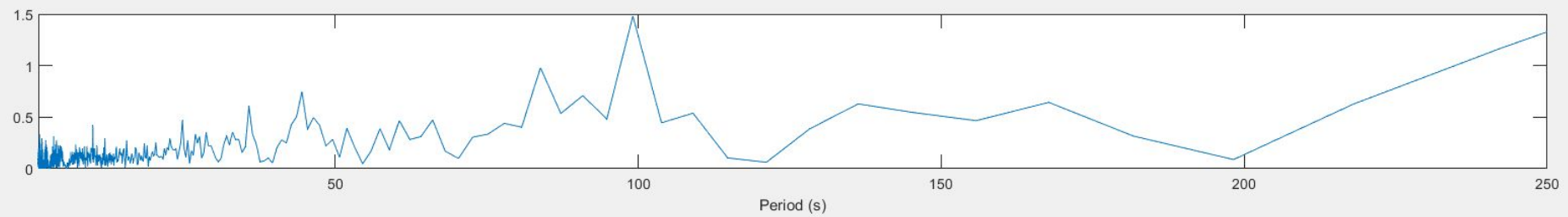
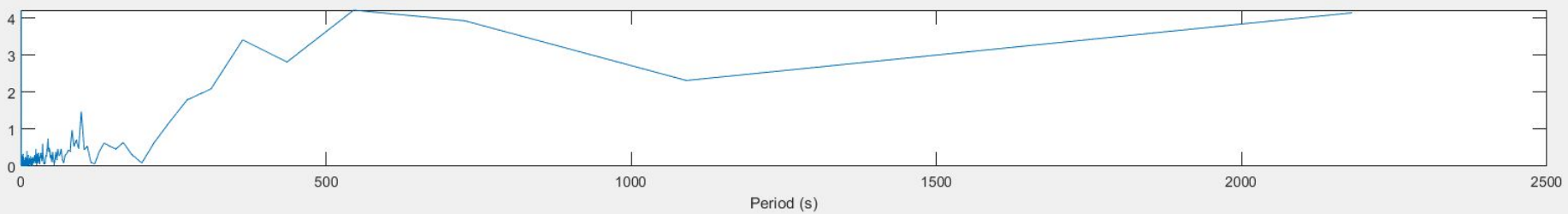
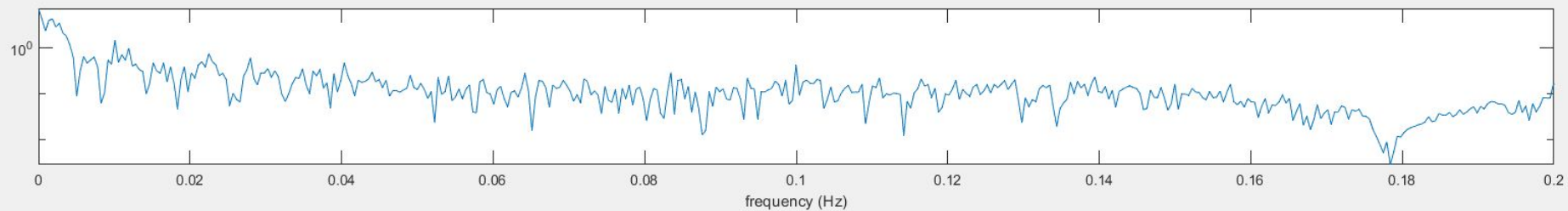
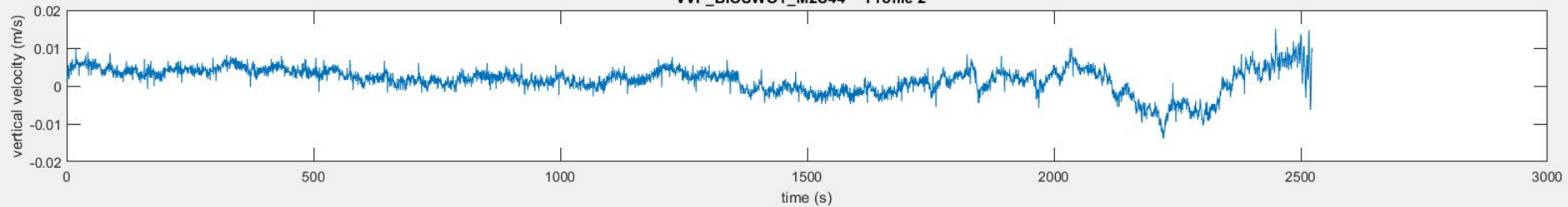
Mean: $5e-5$ m/s

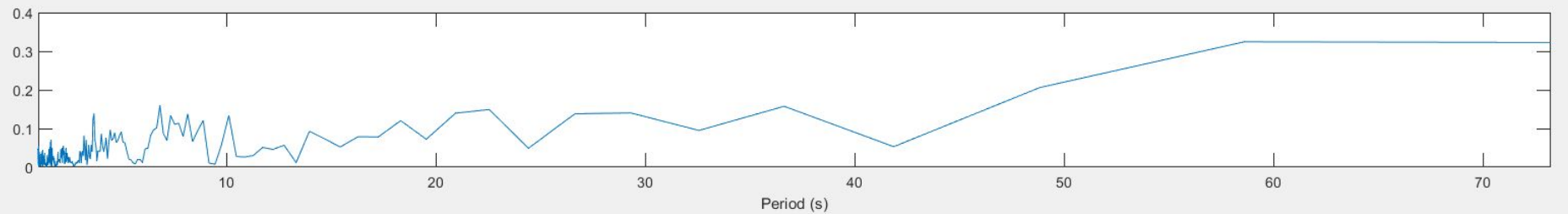
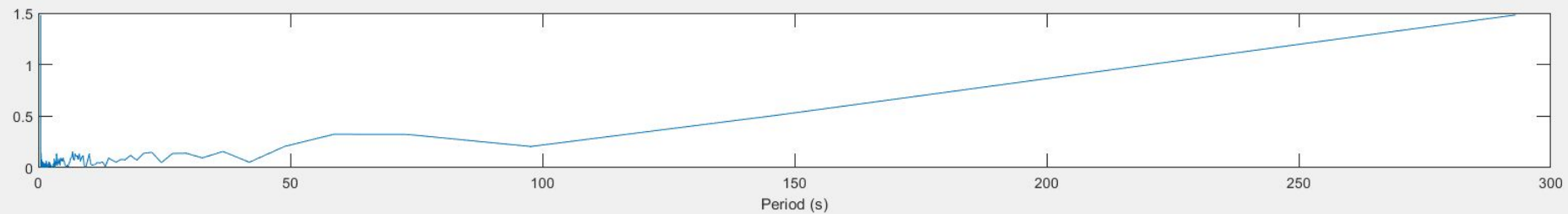
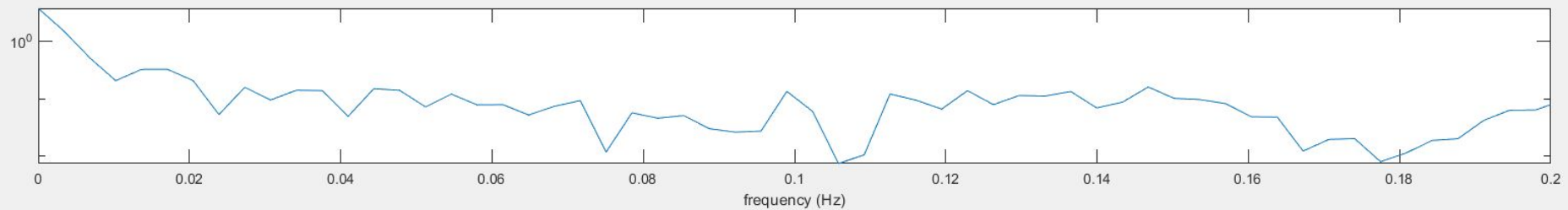
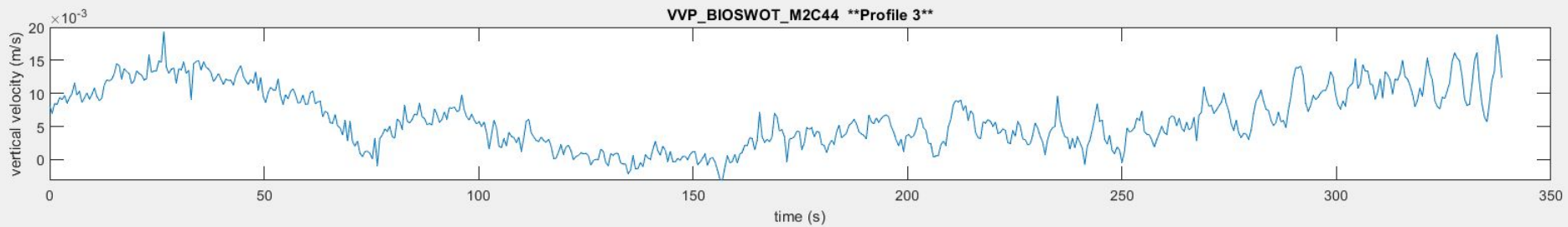
Std: 0.0038



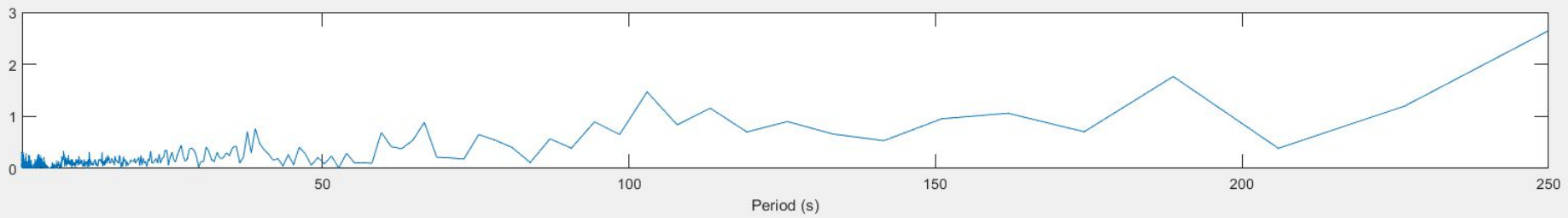
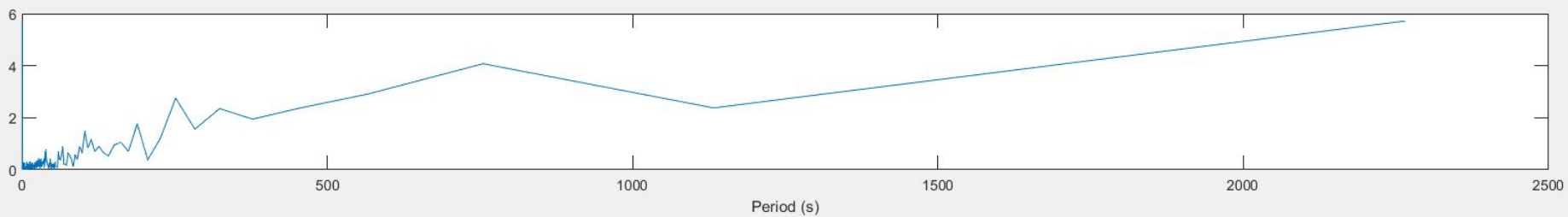
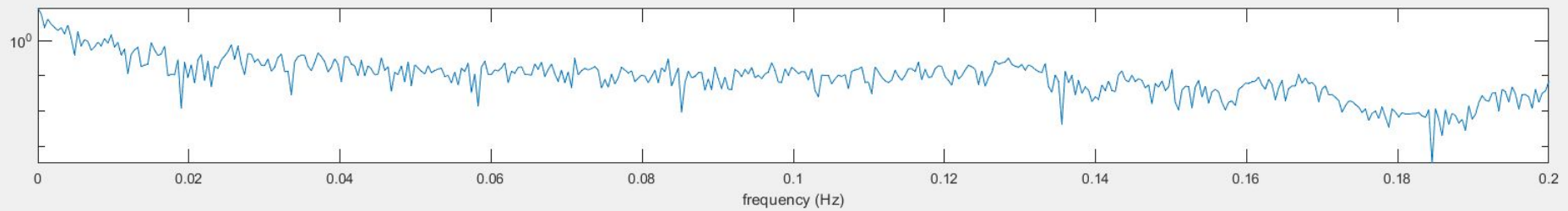
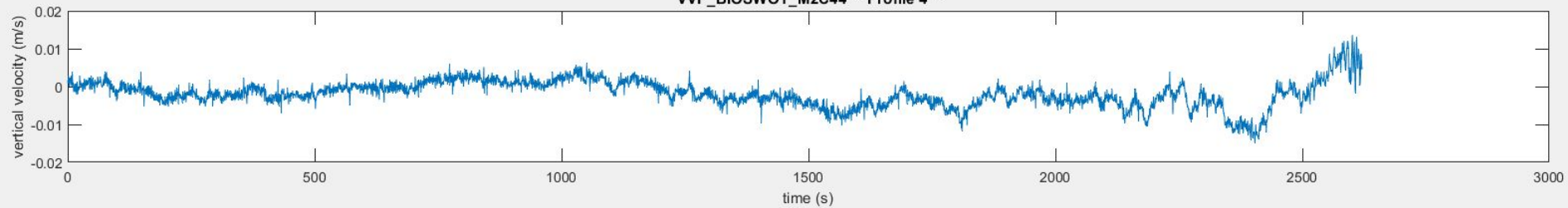


VVP_BIOSWOT_M2C44 **Profile 2**

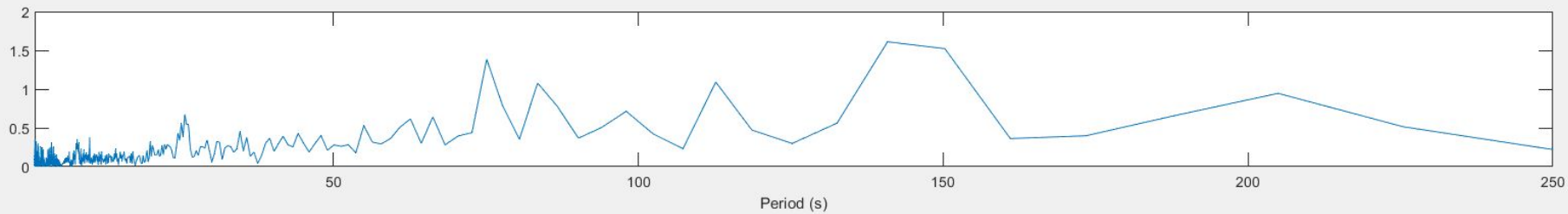
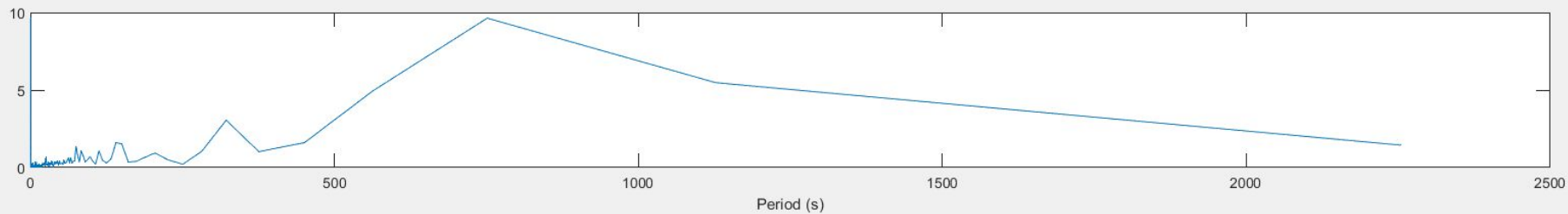
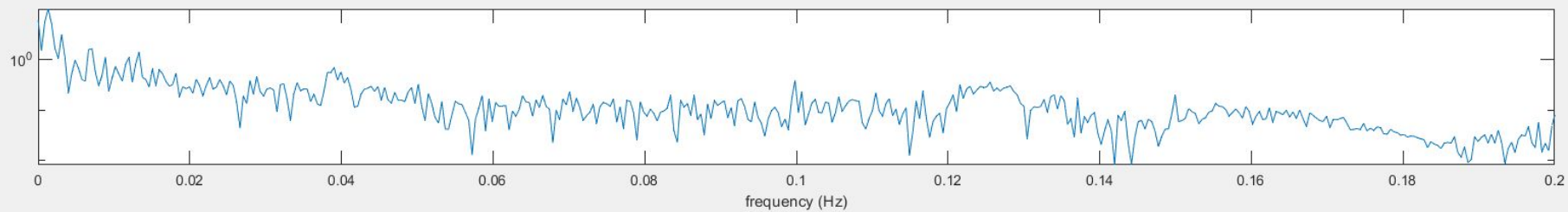
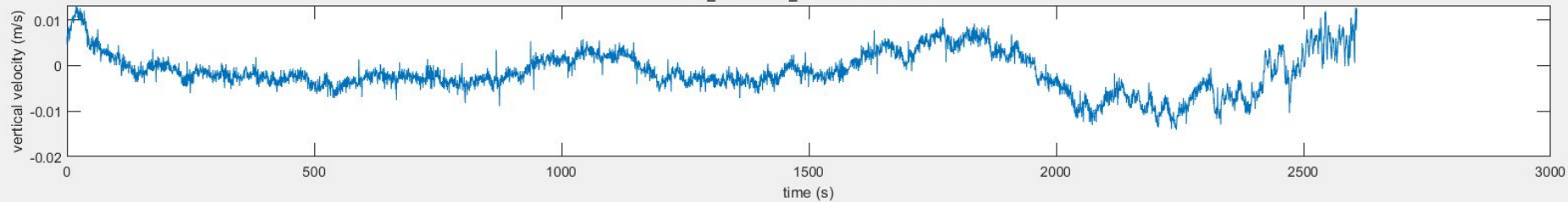


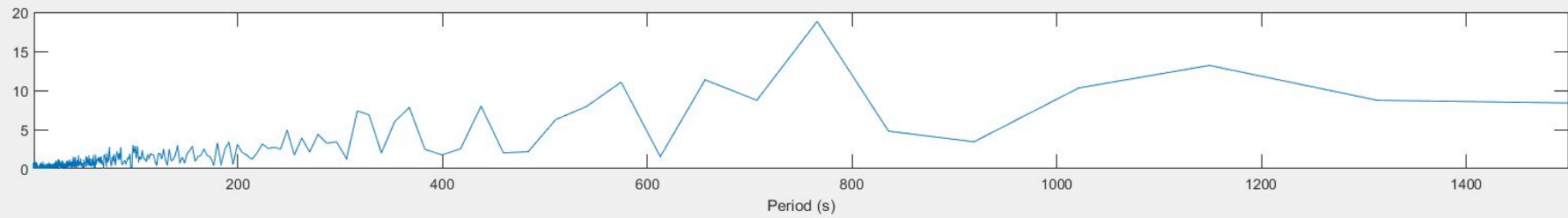
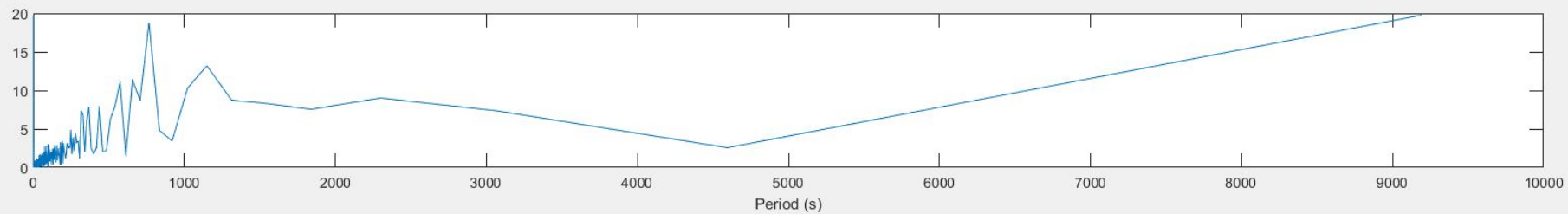
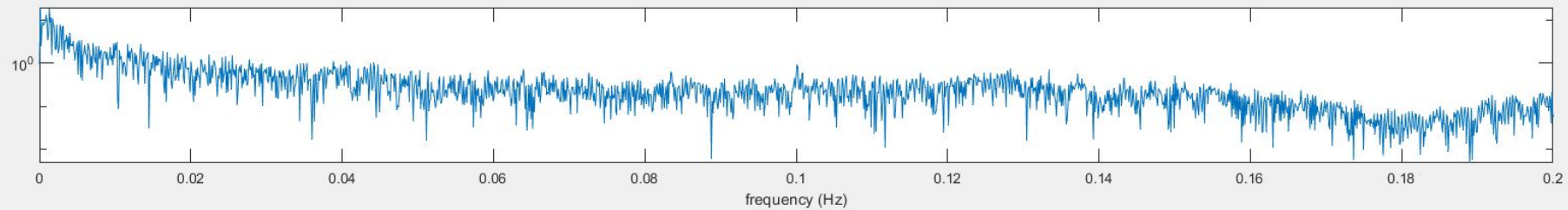
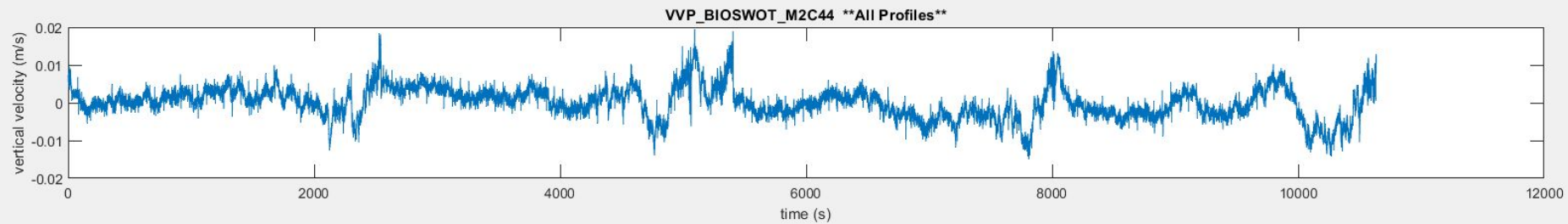


VVP_BIOSWOT_M2C44 **Profile 4**

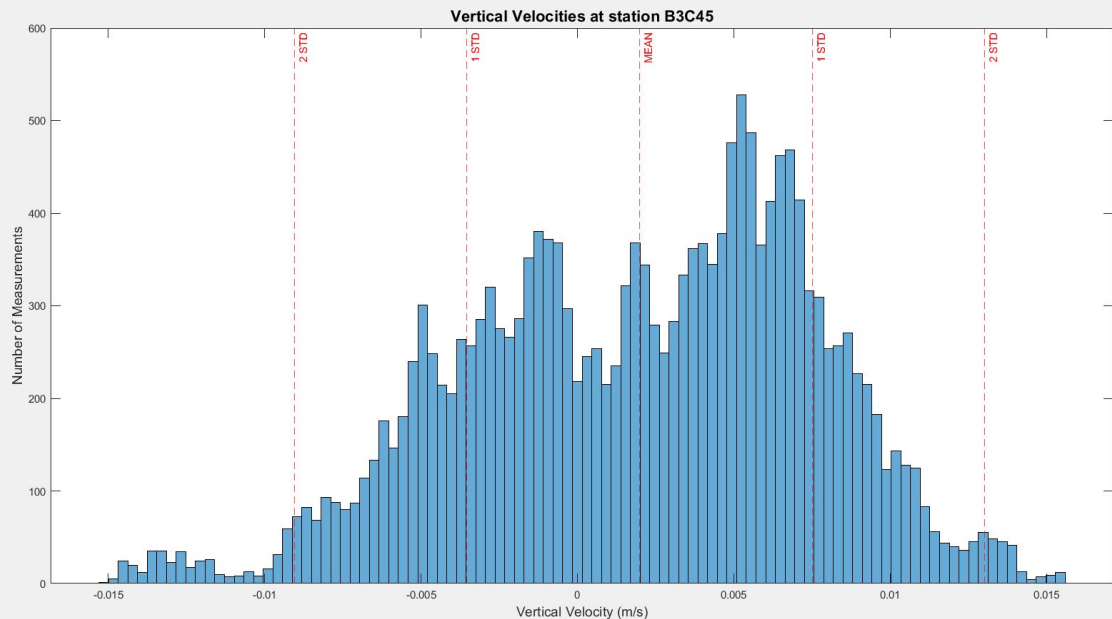


VVP_BIOSWOT_M2C44 **Profile 5**



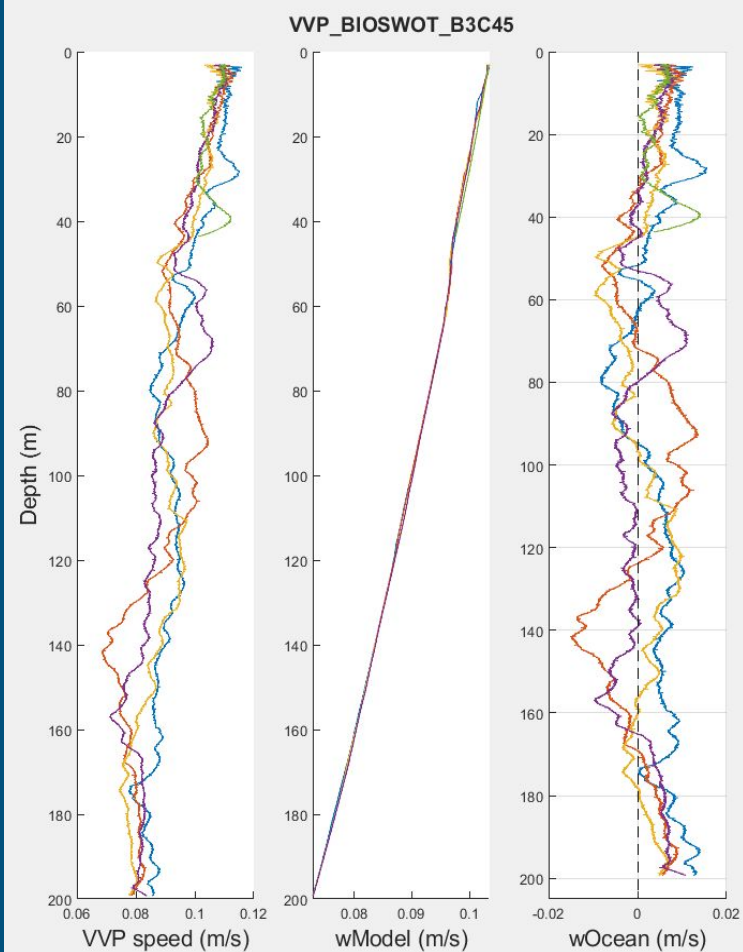


Station B3C45

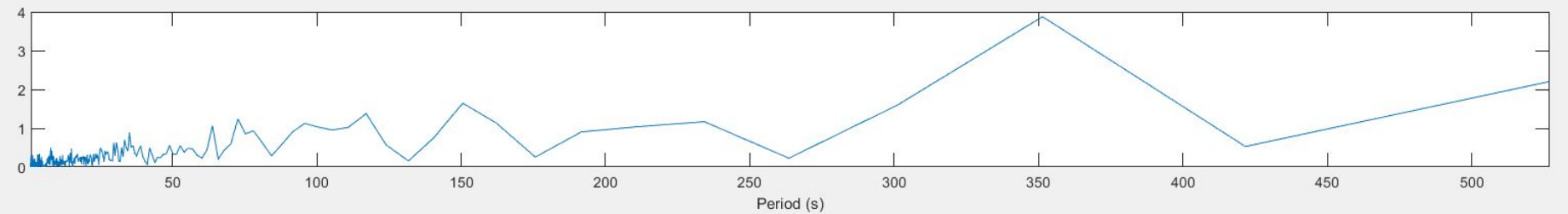
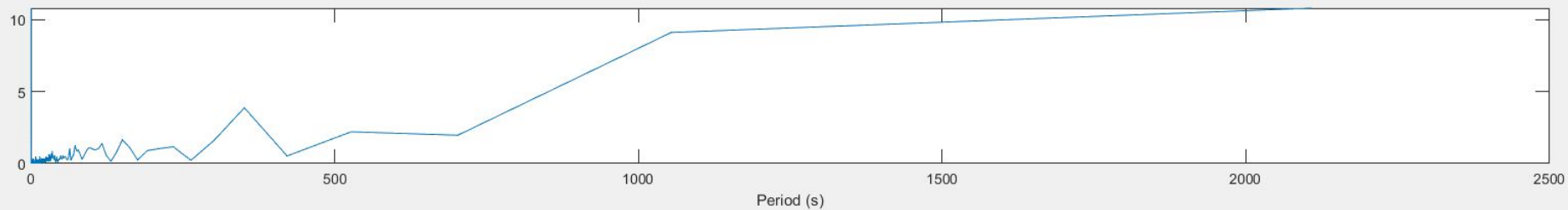
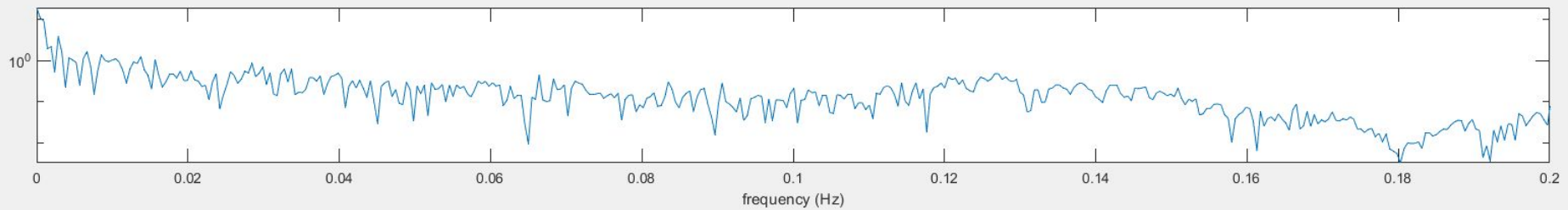
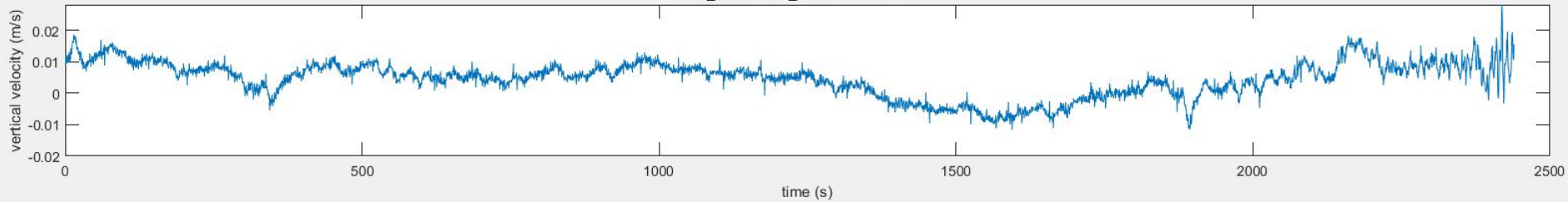


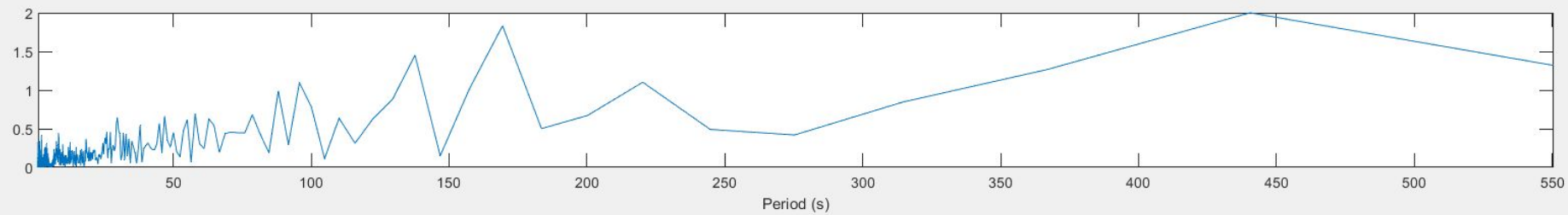
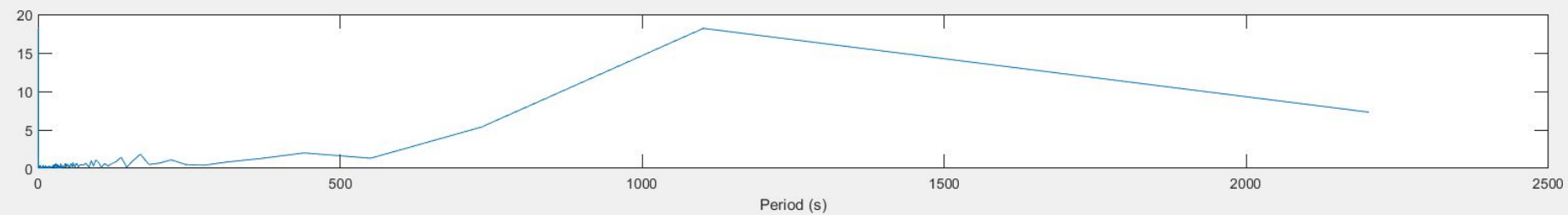
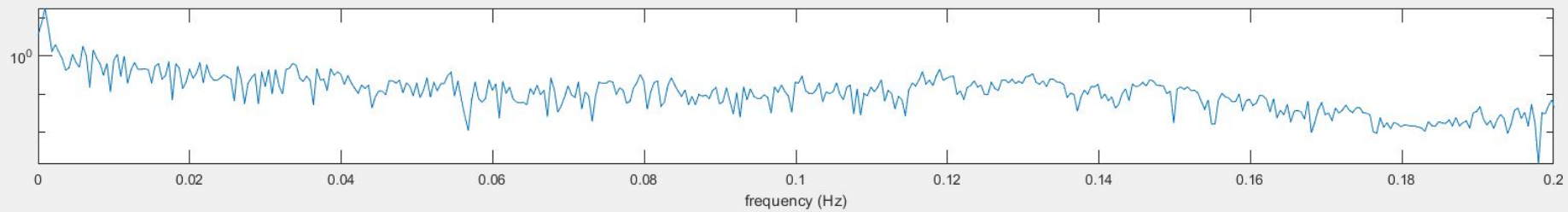
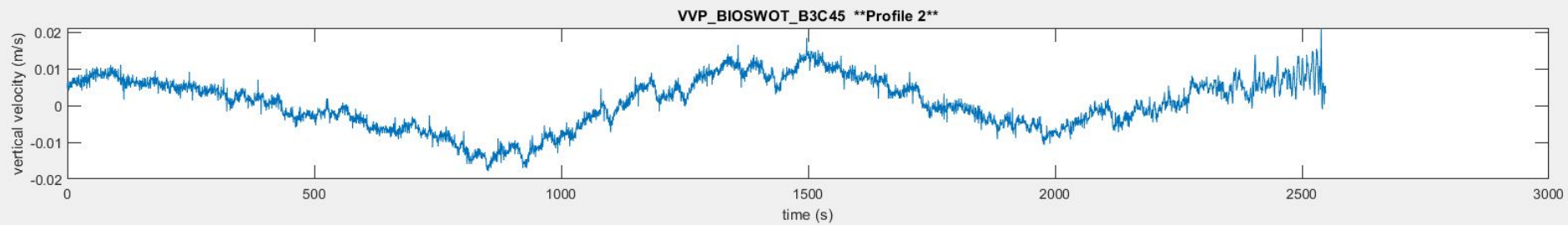
Mean: 0.0020 m/s

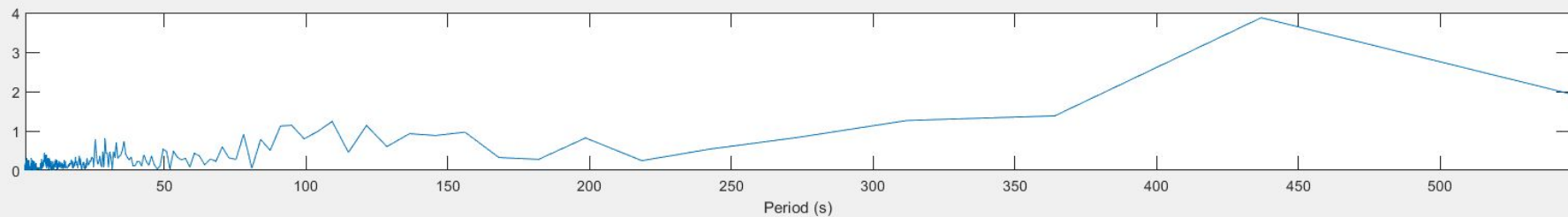
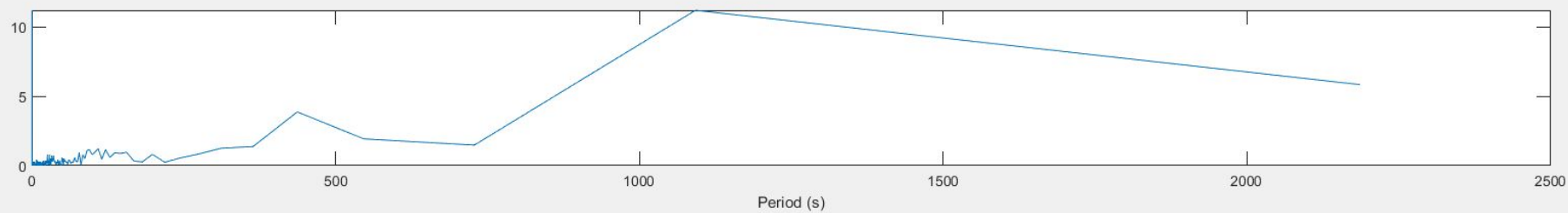
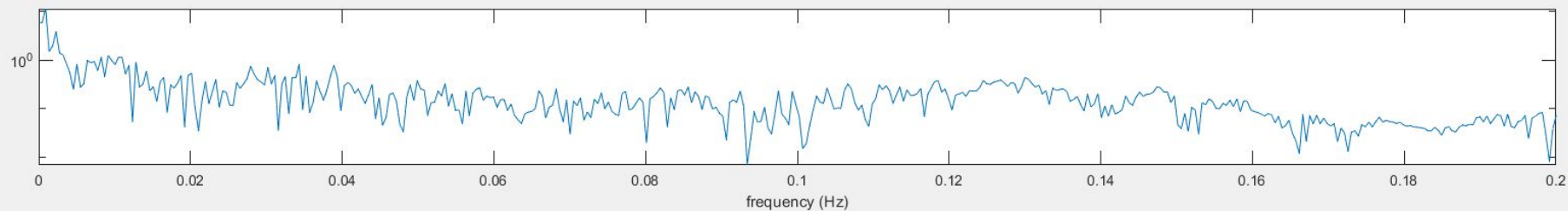
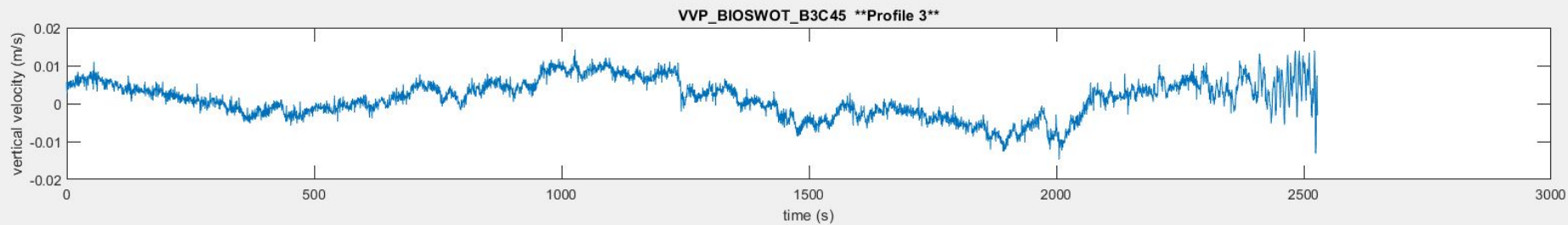
Std: 0.0055



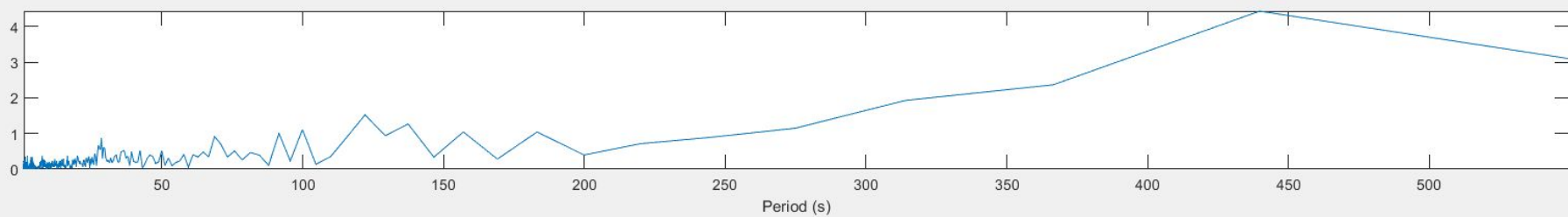
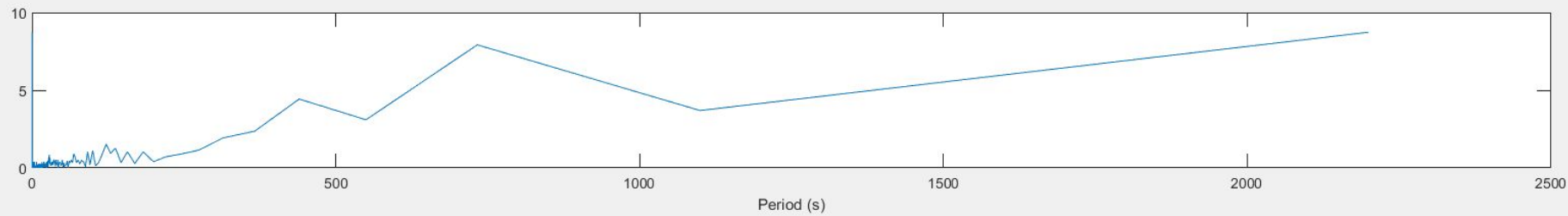
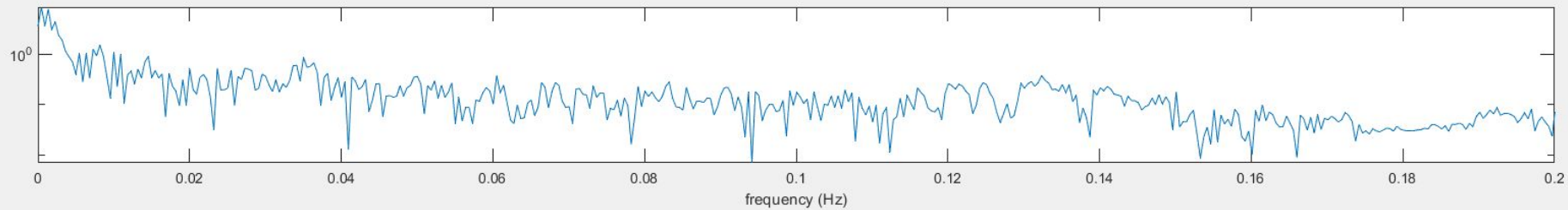
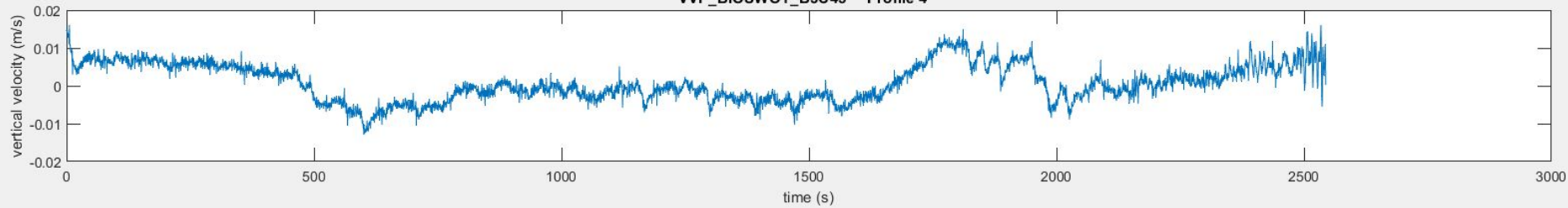
VVP_BIOSWOT_B3C45 **Profile 1**







VVP_BIOSWOT_B3C45 **Profile 4**



VVP_BIOSWOT_B3C45 **Profile 5**

