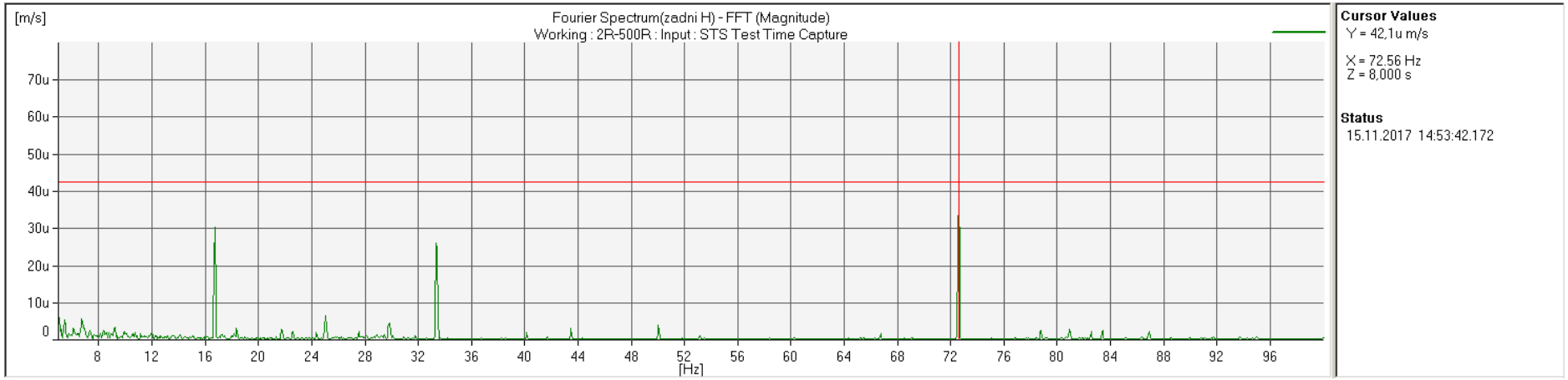
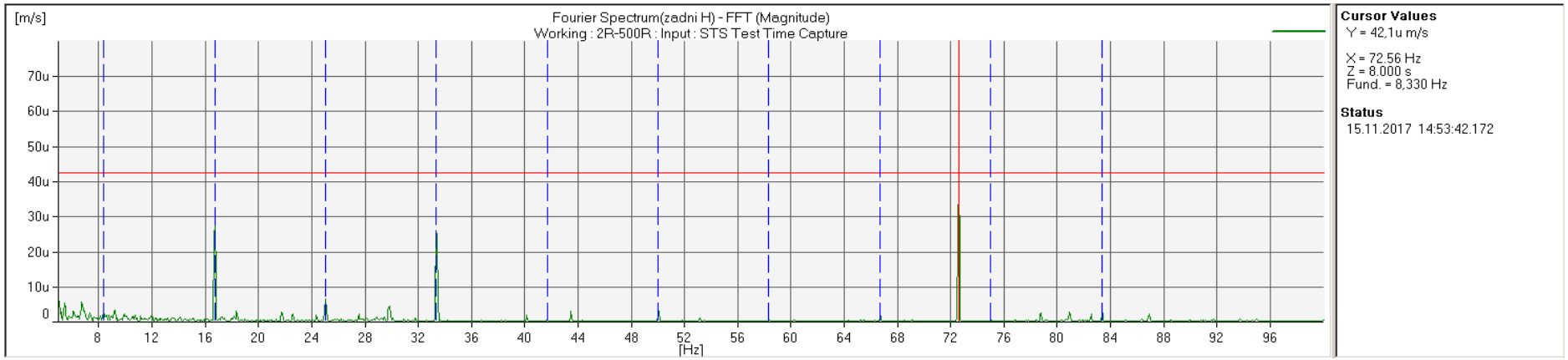
Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

Otacky 500 RPM

2R1-500R



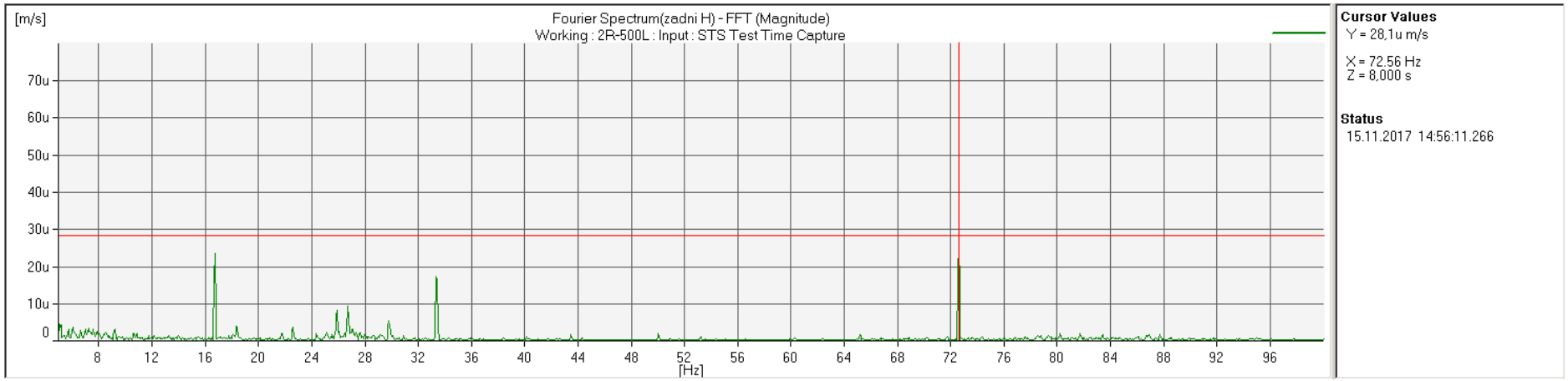
Vyrazna amplituda na frekvenci 72,56Hz



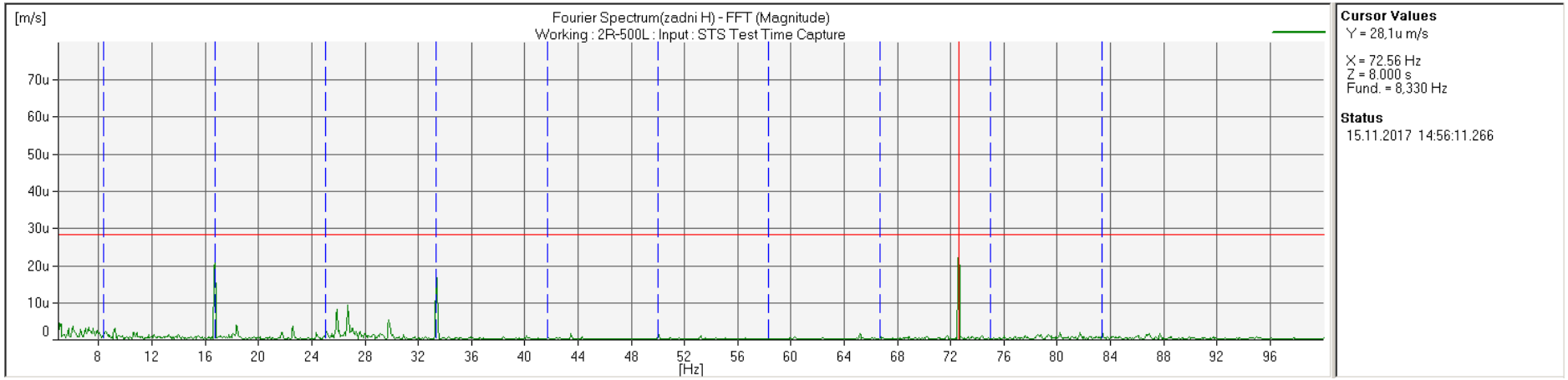
Vyrazna 2. a 4. Otackova frekvence otackove vretene (8.33Hz)

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R1-500L



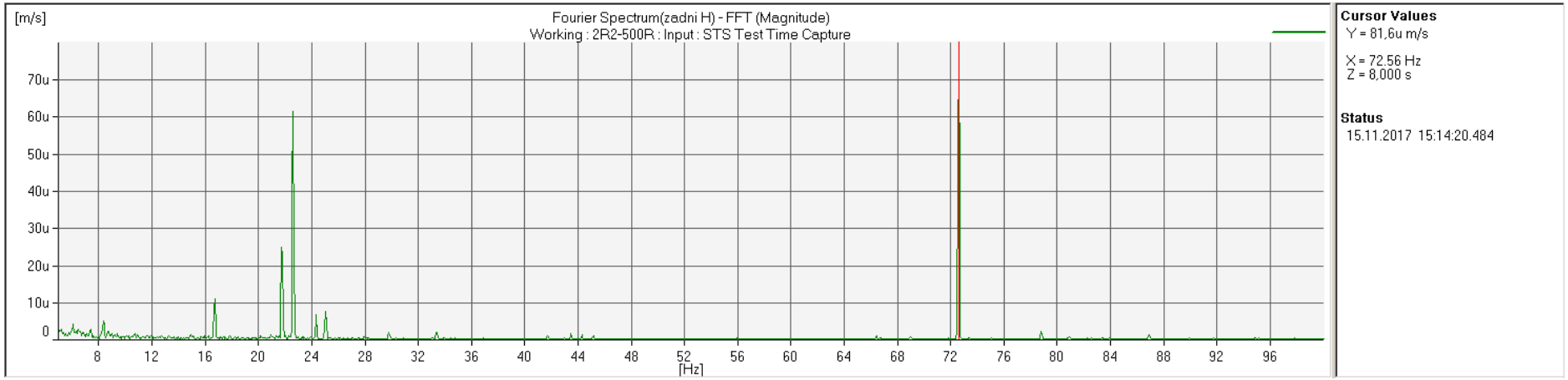
Vyrazna amplituda na frekvenci 72,56Hz



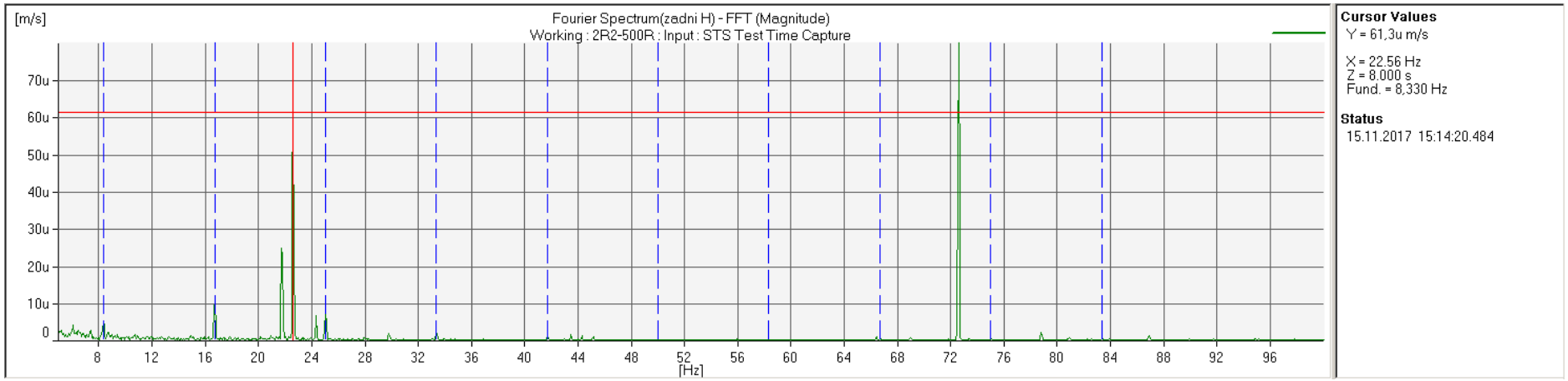
Vyrazna 2. a 4. Otackova frekvence otackove vretene (8.33Hz)

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R2-500R

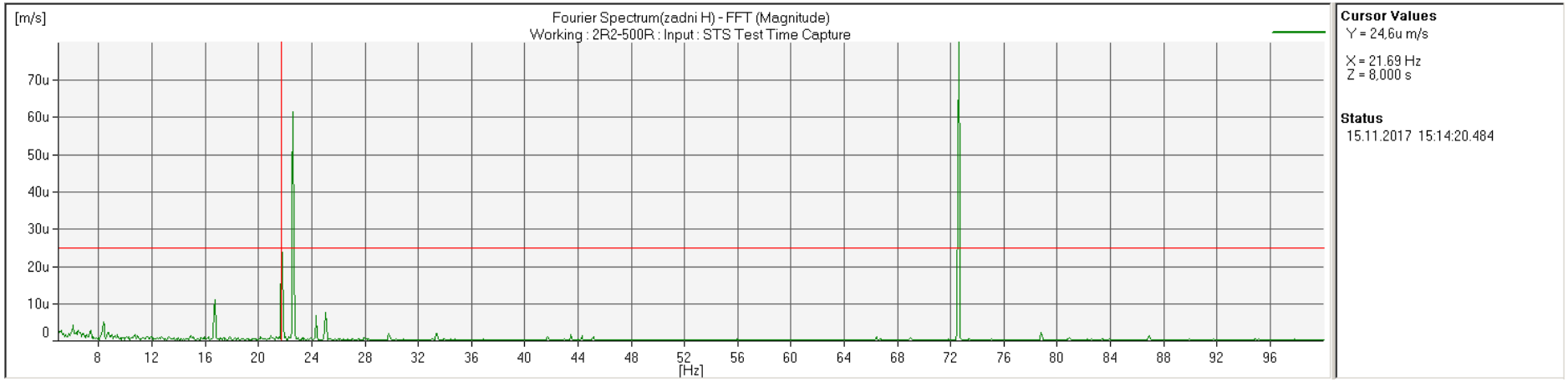


Vyrazna amplituda na frekvenci 72,56Hz



Pozorovatelna 2. a 3. otackova frekvence otackove vretene (8.33Hz). Vyrazna amplitude na otackove frekvenci hridele A2 (22,55Hz).

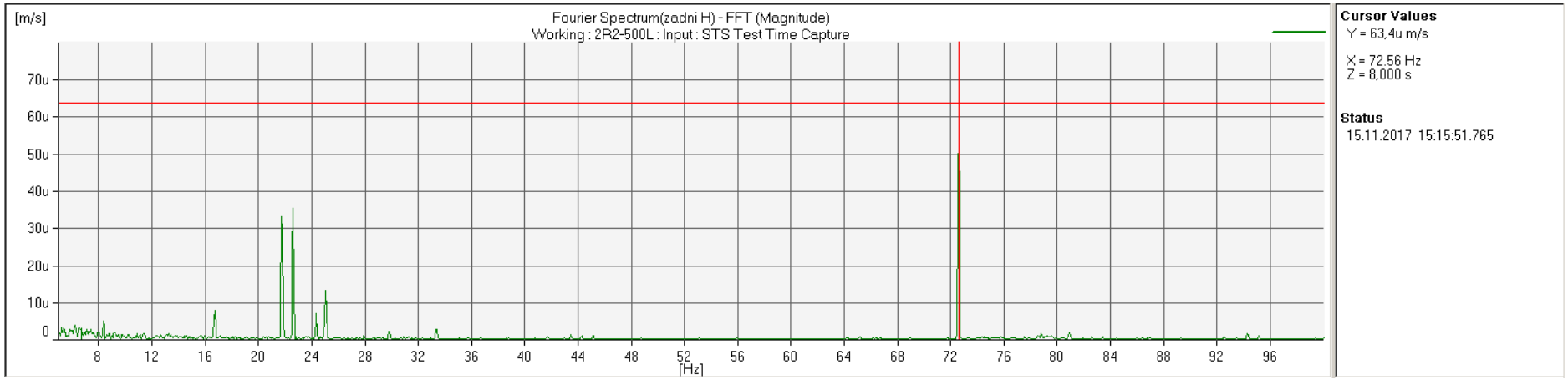
Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz



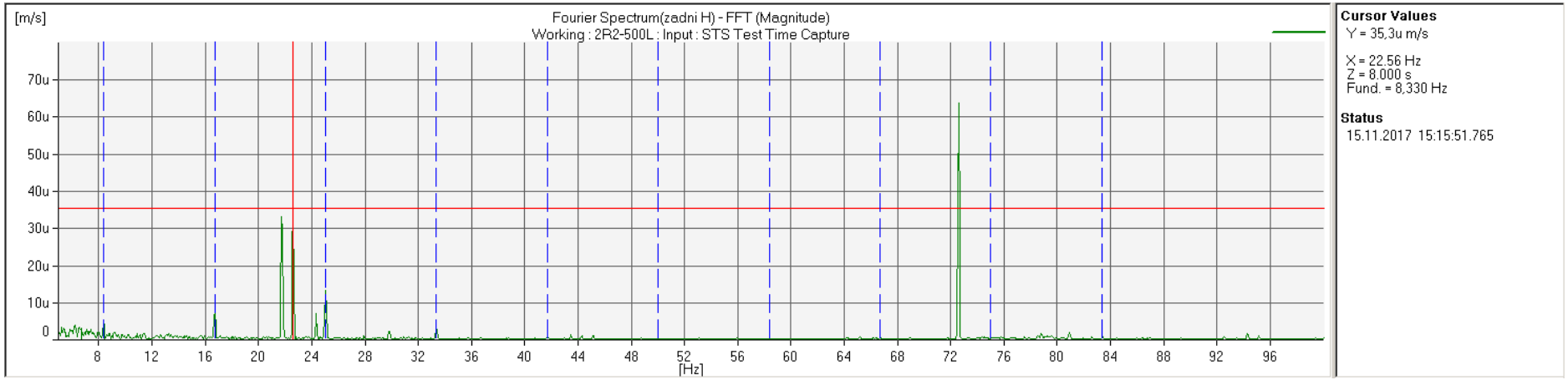
Na frekvenci 21,7Hz pozorovatelna otackova frekvence hridelu A3.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R2-500L

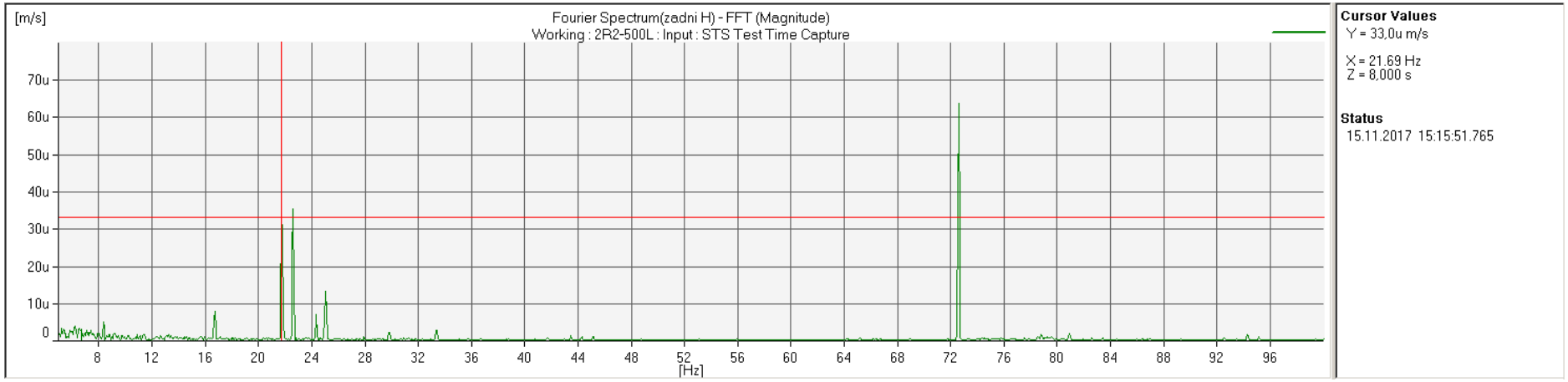


Vyrazna amplituda na frekvenci 72,56Hz



Pozorovatelna 2. a 3. otackova frekvence otackove vretene (8.33Hz). Vyrazna amplitude na otackove frekvenci hridele A2 (22,55Hz).

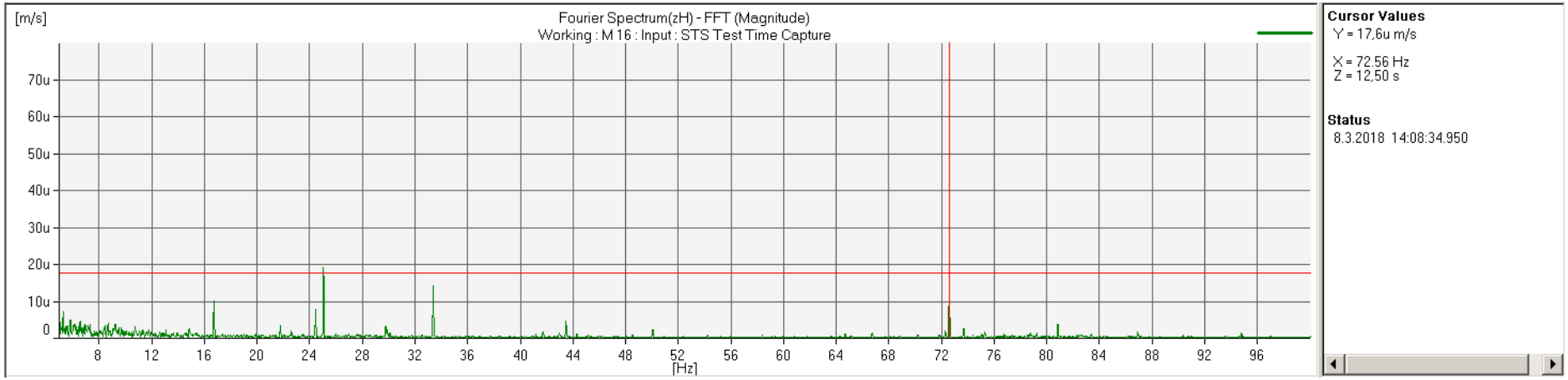
Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz



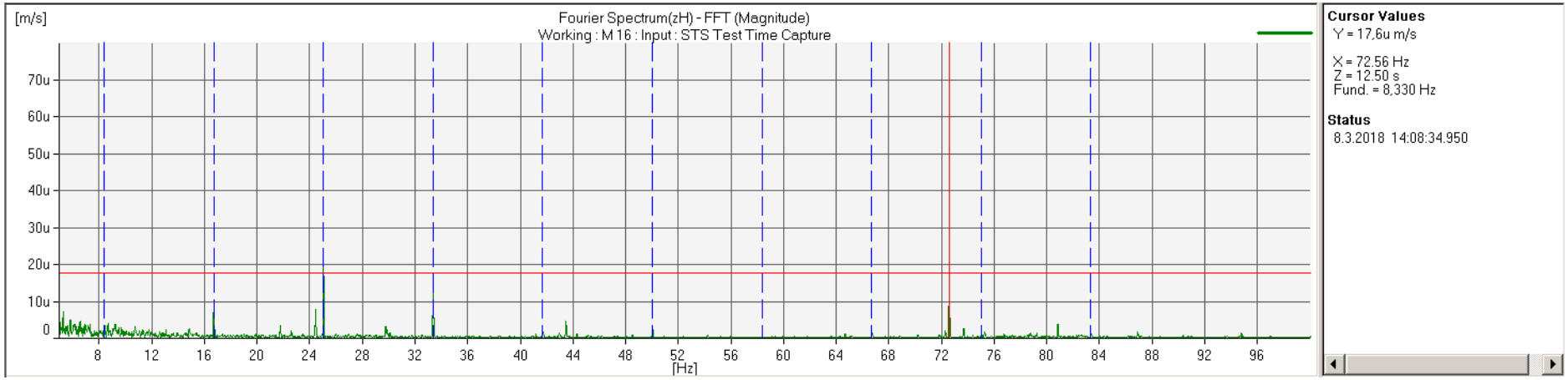
Na frekvenci 21,7Hz pozorovatelna otackova frekvence hridelu A3.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-500R



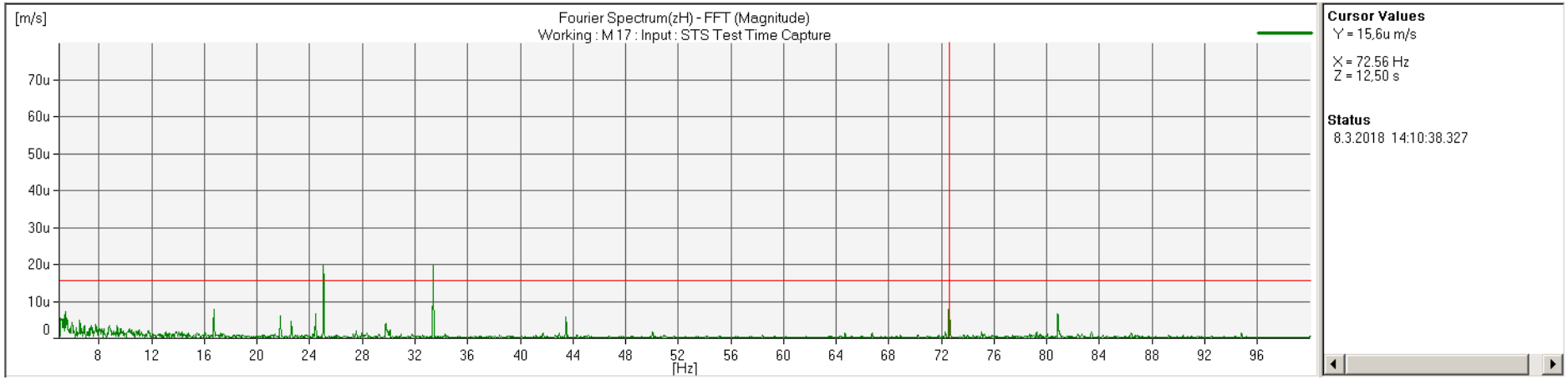
Vyrazna amplituda na frekvenci 72,56Hz



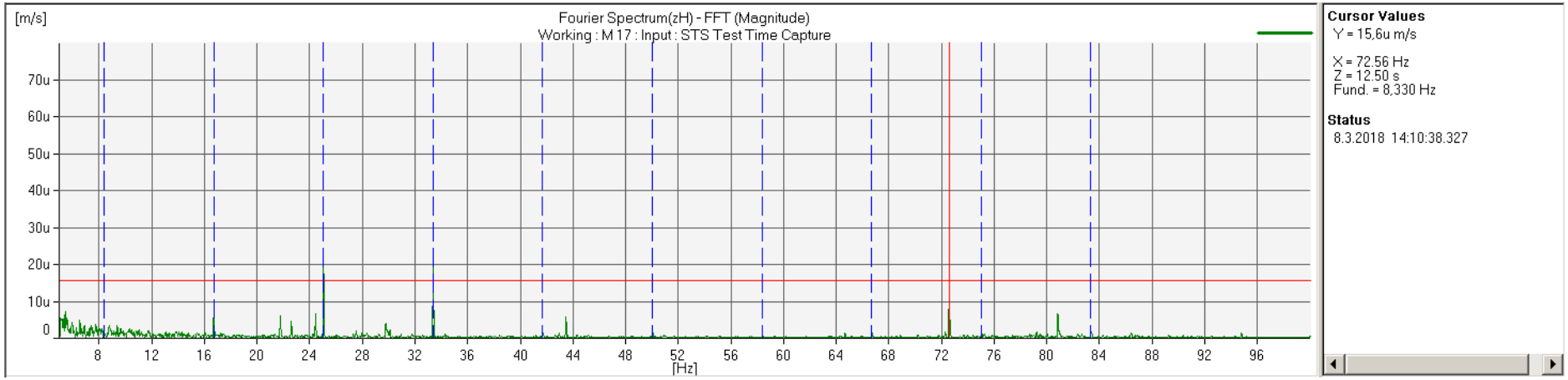
Vyrazna 2. 3. a 4. Otackova frekvence otackove vretene (8.33Hz)

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-500L



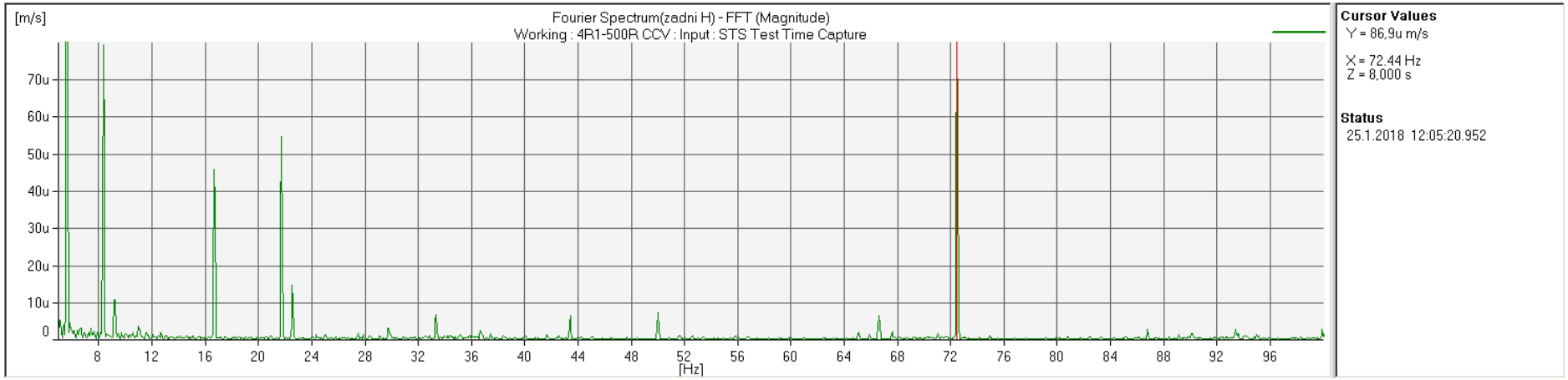
Vyrazna amplituda na frekvenci 72,56Hz



Vyrazna 2. 3. a 4. Otackova frekvence otackove vretene (8.33Hz)

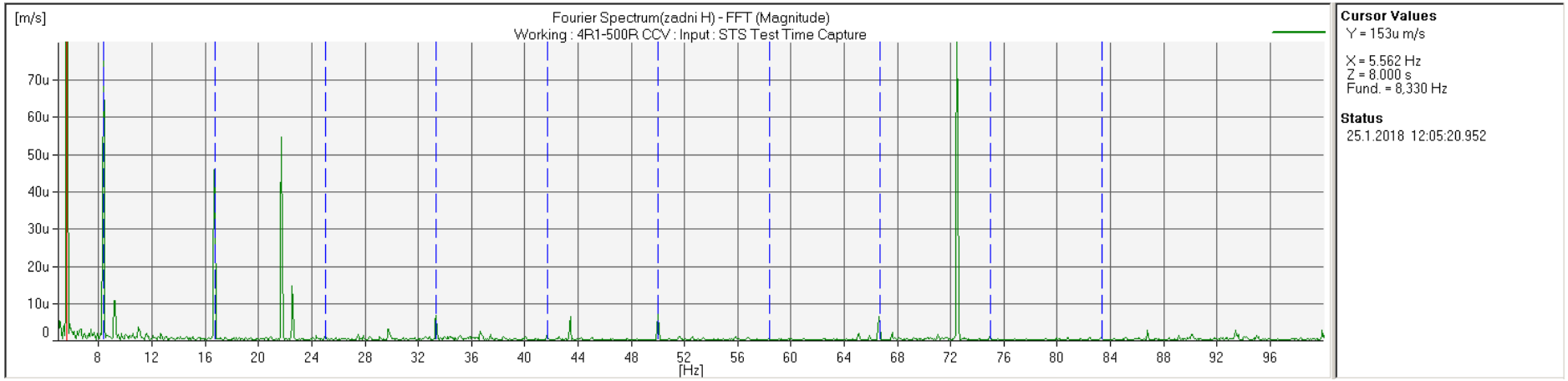
Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

4R1-500R

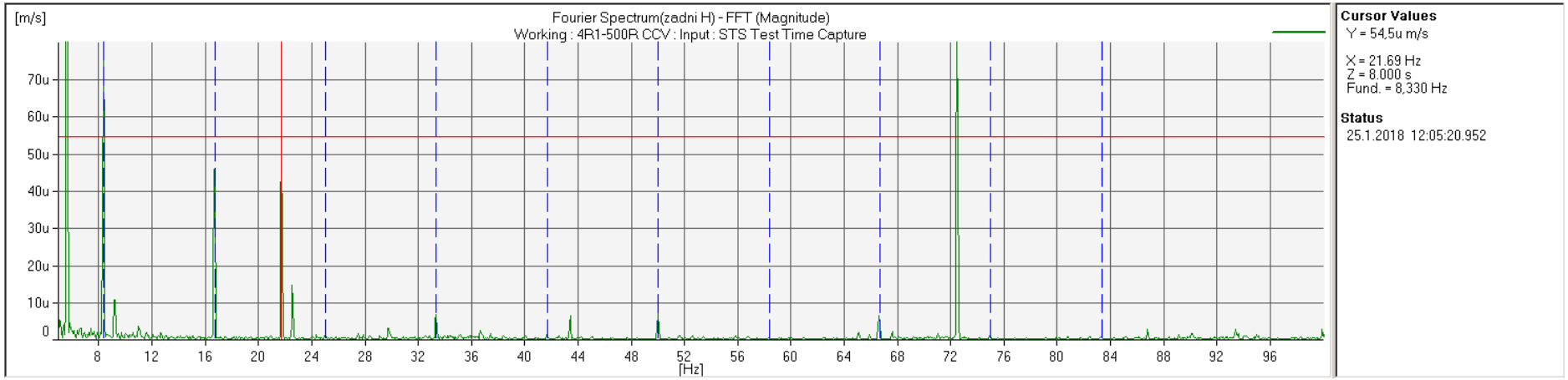


Vyrazna amplituda na frekvenci 72,56Hz

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz



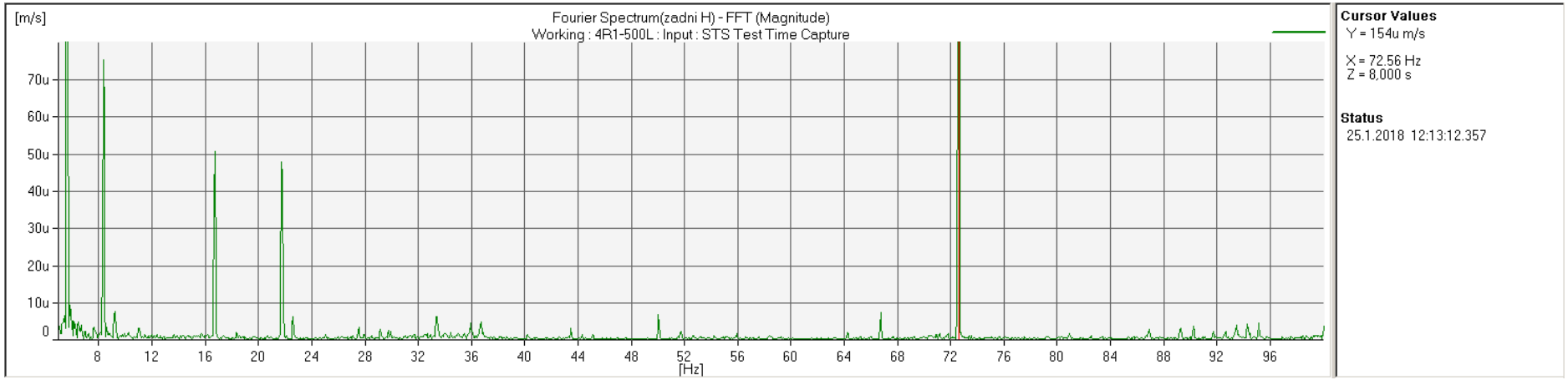
Vyrazna 1. a 2. Otackova frekvence otackove vretene (8.33Hz). Vyrazna amplituda na 5,56Hz (2/3 otackove vretene nebo otackova hridele A3 pokud by byl na 500 otacek vretene zarazen 3. Prevodovy stupen pozn. Tento vretenik byl meren na zkusebni stolici a razeni probihalo manualne od obsluhy, moznost chyby)



Vyrazna amplituda na 21,7Hz odpovida otackove frekvenci hridelu A3.

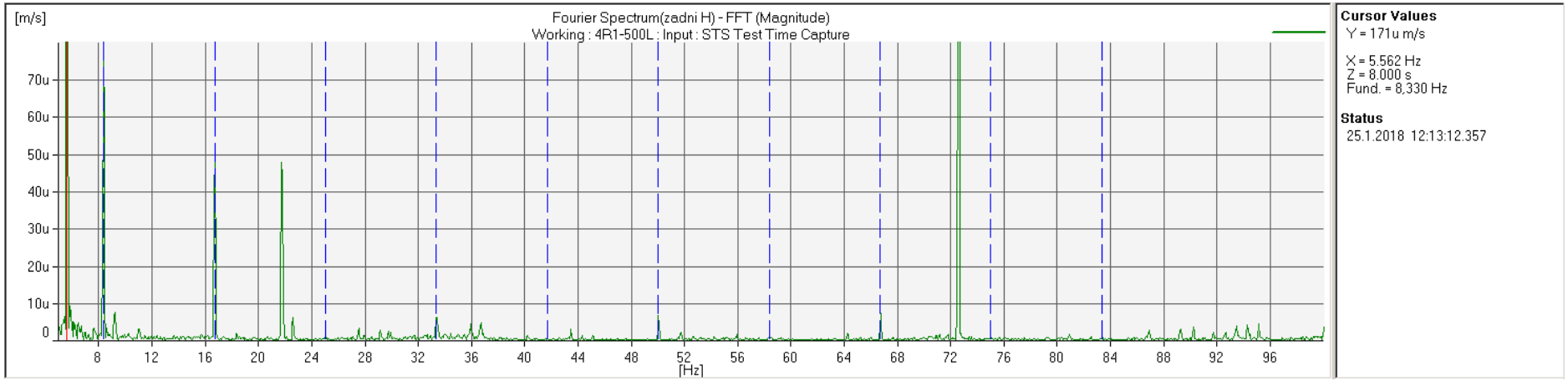
Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

4R1-500L

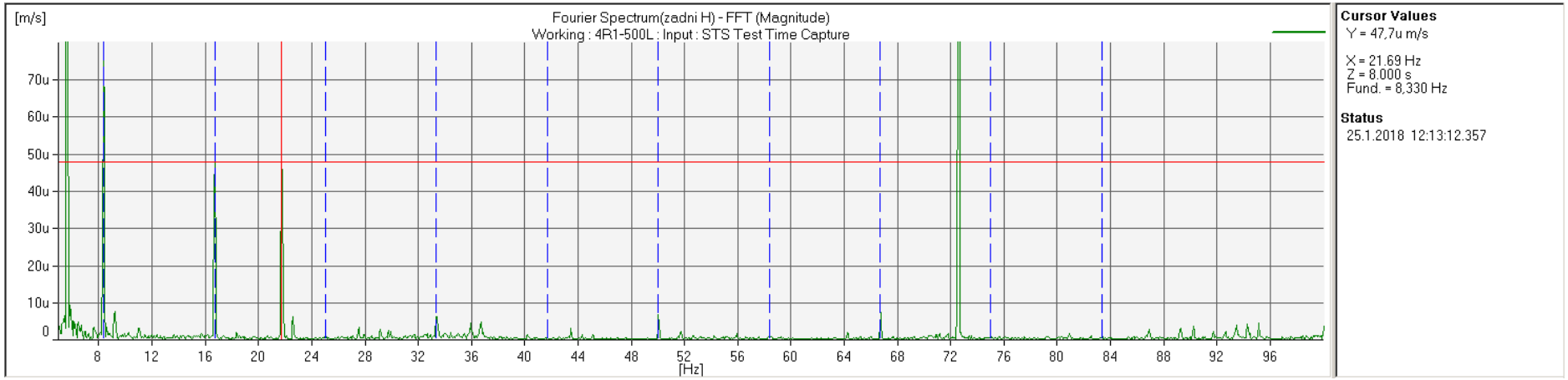


Vyrazna amplituda na frekvenci 72,56Hz

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz



Vyrazna 1. a 2. Otackova frekvence otackove vretene (8.33Hz). Vyrazna amplituda na 5,56Hz (2/3 otackove vretene nebo otackova hridele A3 pokud by byl na 500 otacek vretene zarazen 3. Prevodovy stupen pozn. Tento vretenik byl meren na zkusebni stolici a razeni probihalo manualne od obsluhy, moznost chyby)

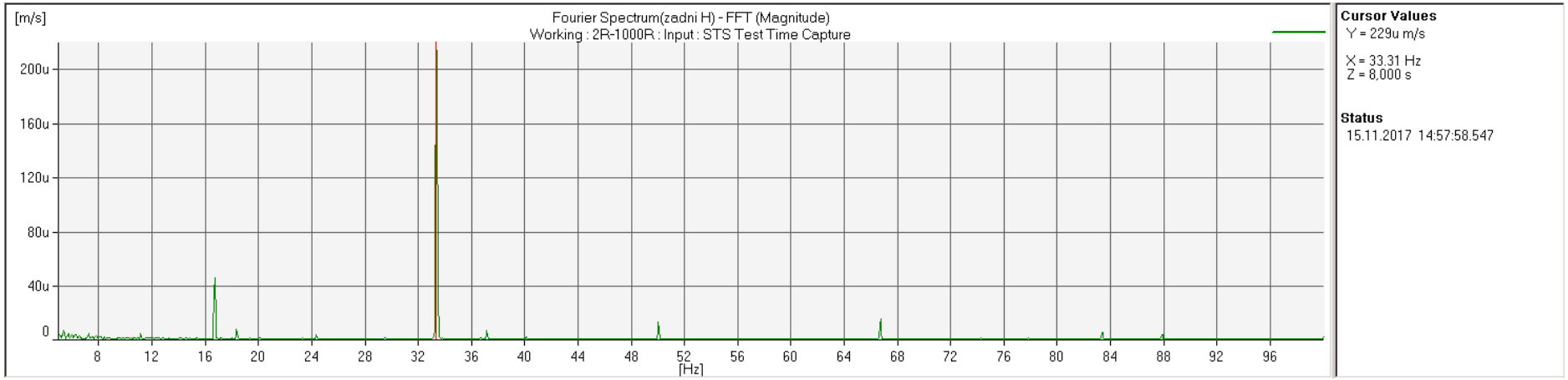


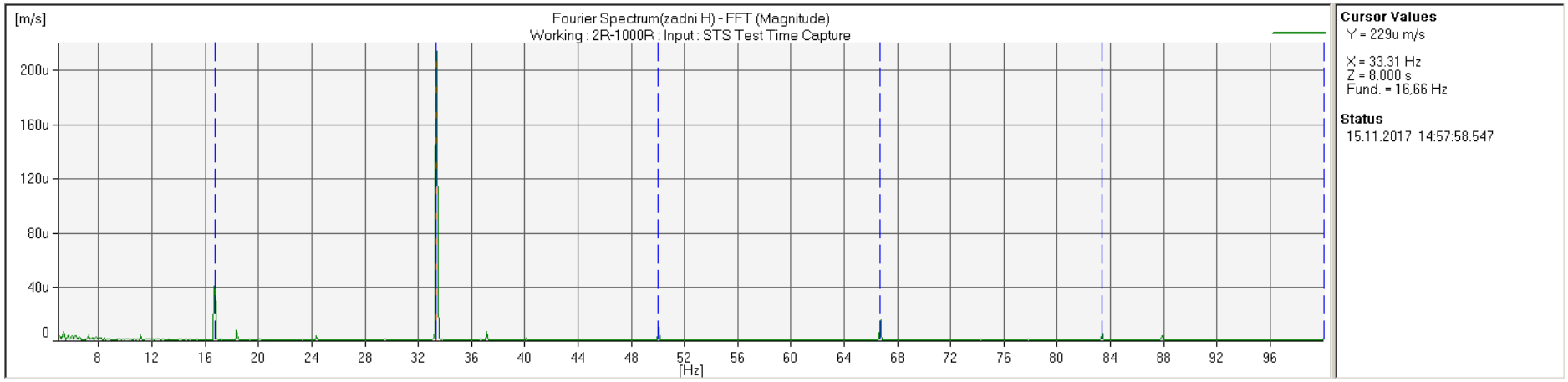
Vyrazna amplituda na 21,7Hz odpovida otackove frekvenci hridelu A3.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

Otacky 1000 RPM

2R1-1000R

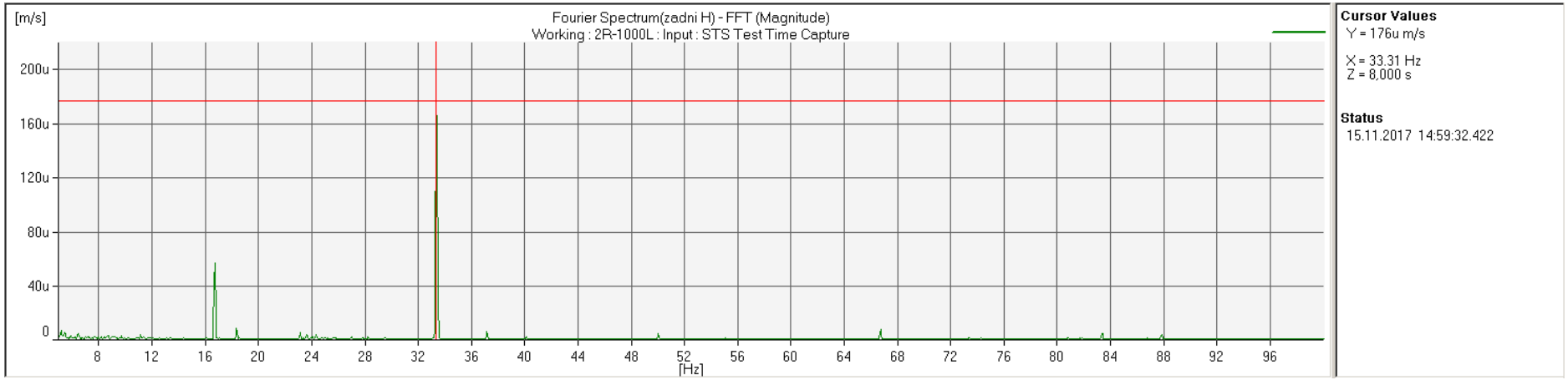


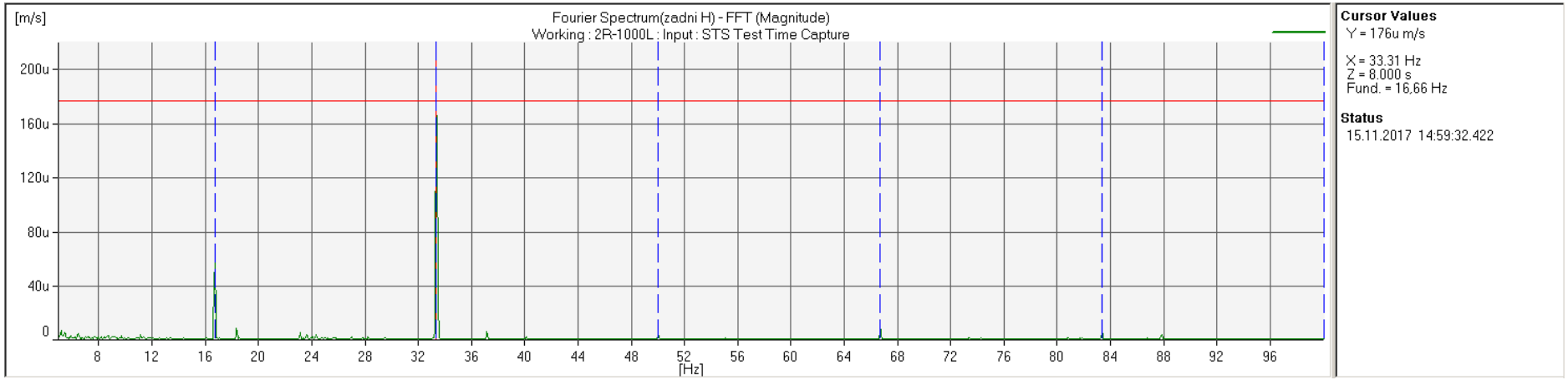


Vyrazna 1. 2. 3. i 4. Otackova frekvence otackove vretene (16,67 Hz).

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R1-1000L

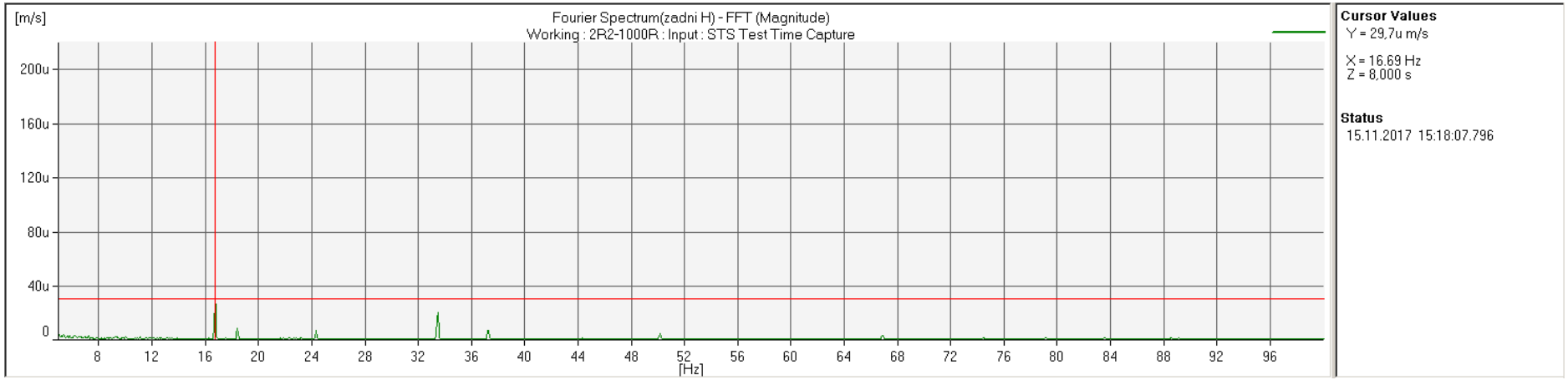


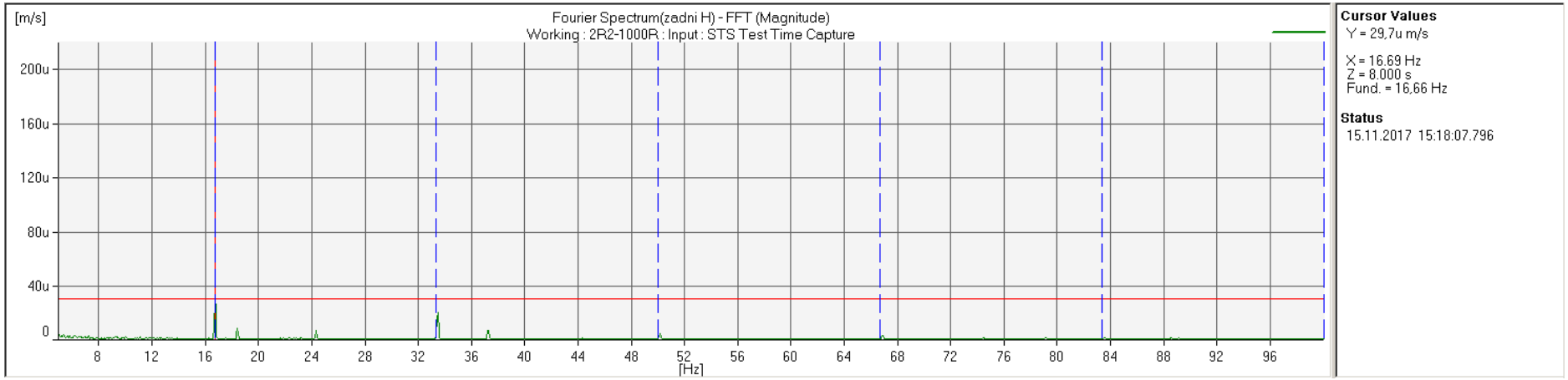


Vyrazna 1. a 2. Otackova frekvence otackove vretene (16,67Hz).

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R2-1000R

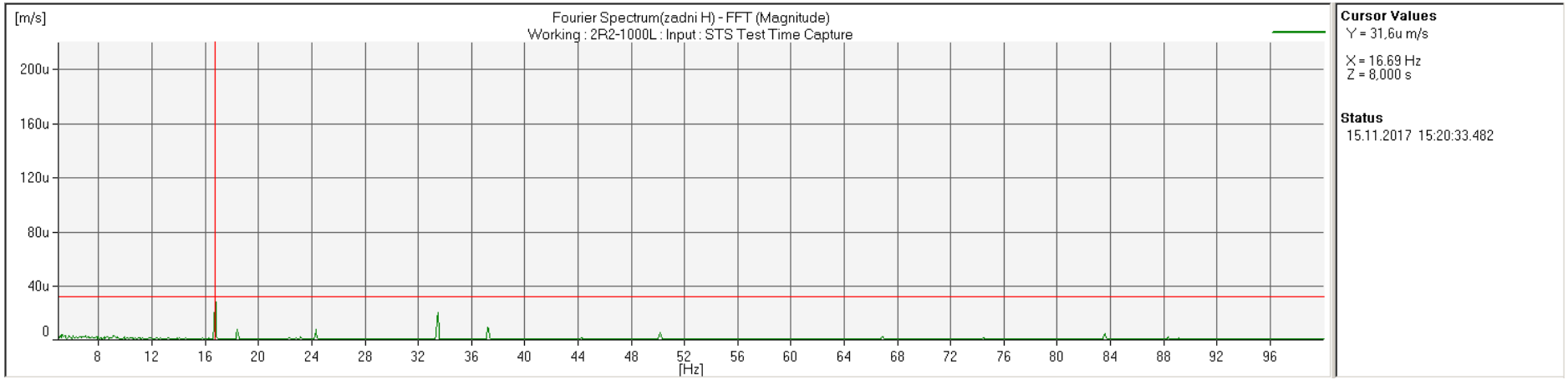


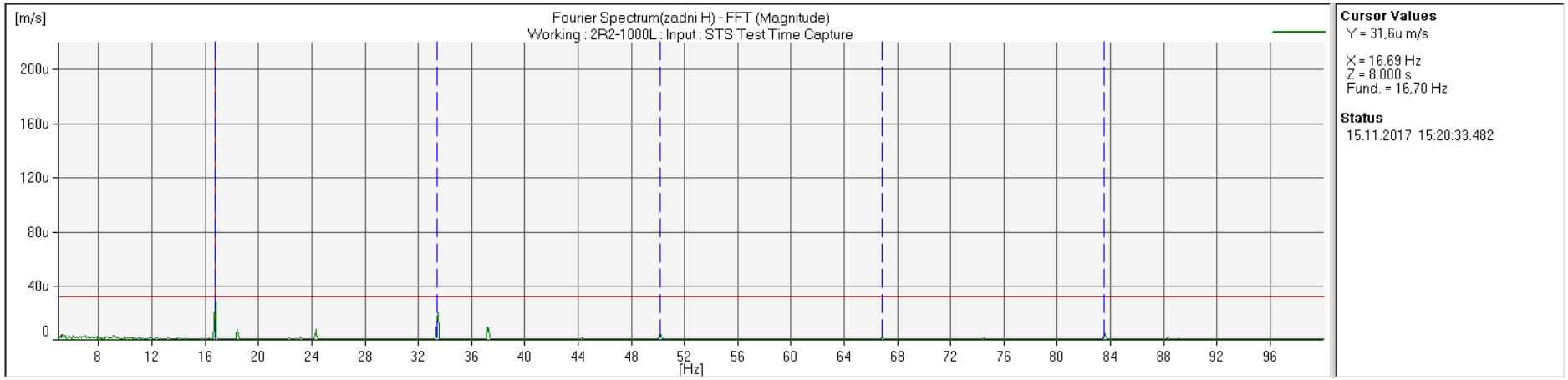


Pozorovatelna 1. a 2. Otackova frekvence otackove vretene (16,67 Hz).

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R2-1000L

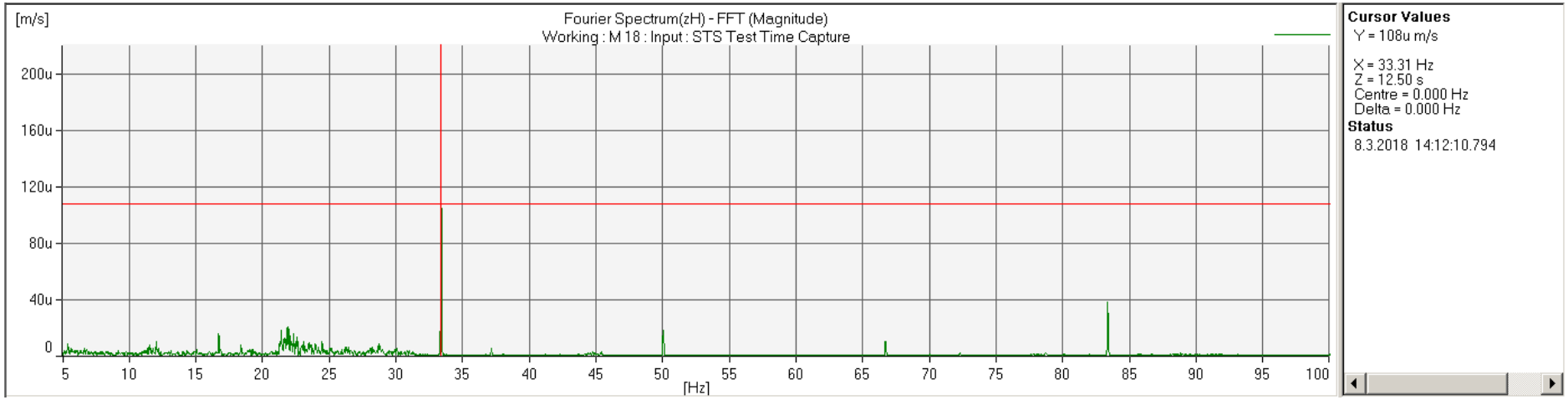




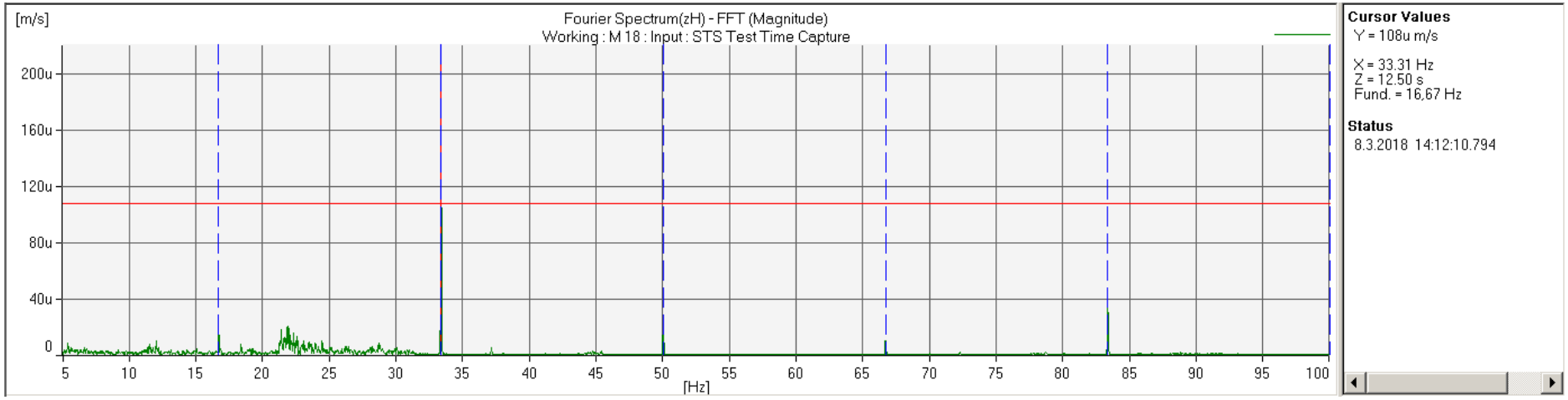
Pozorovatelna 1. a 2. Otackova frekvence otackove vretene (16,67 Hz).

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-1000R



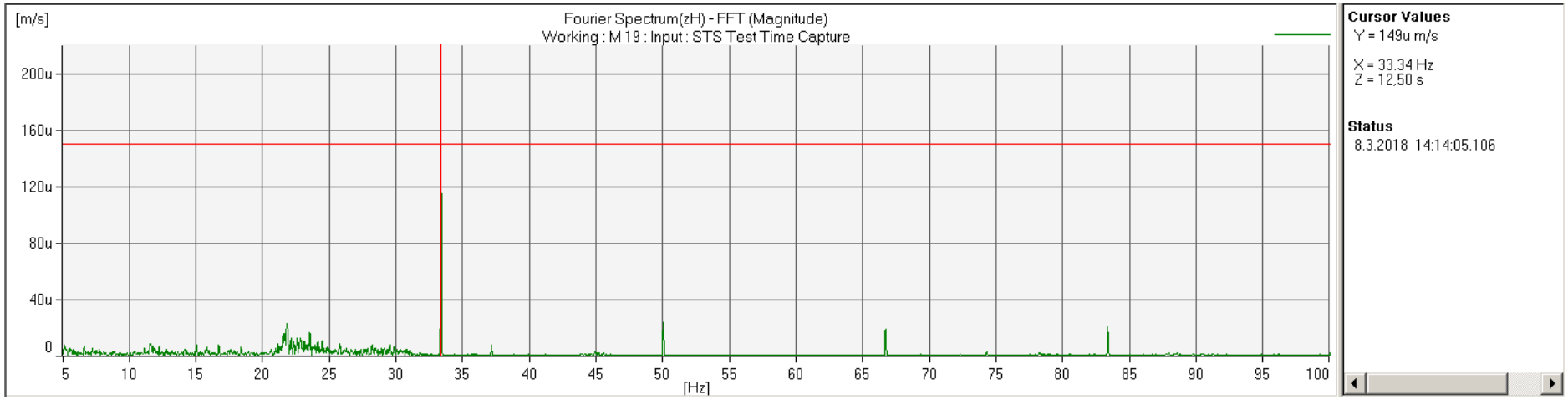
Nejvyssi amplitude na 33,33Hz coz odpovida 2. Otackove frekvenci otackove vretene.



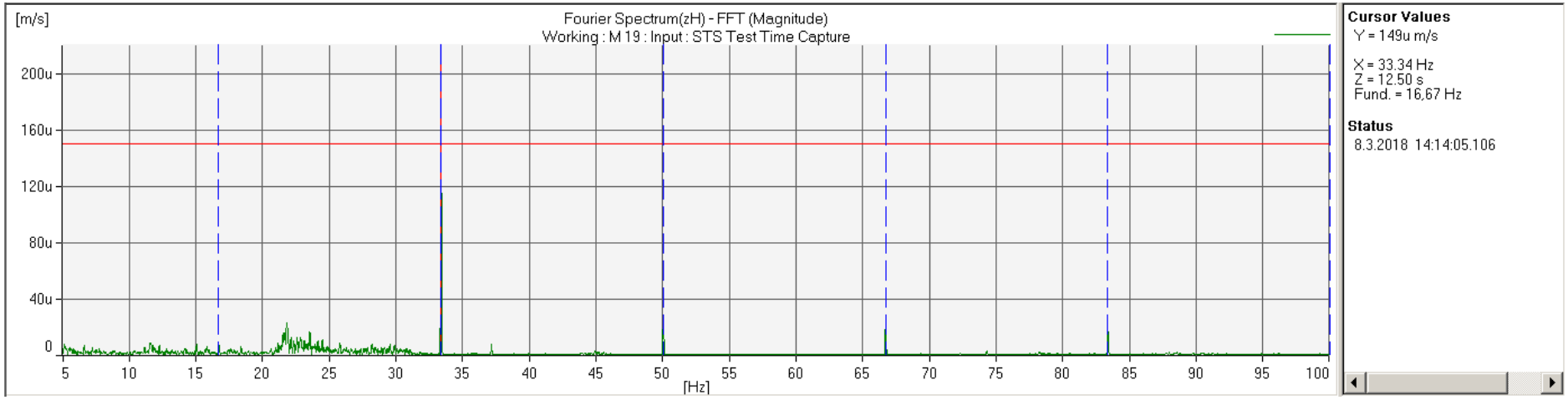
Vyrazna 1. 2. 3. 4. i 5. Otackova otackove vretene

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-1000L



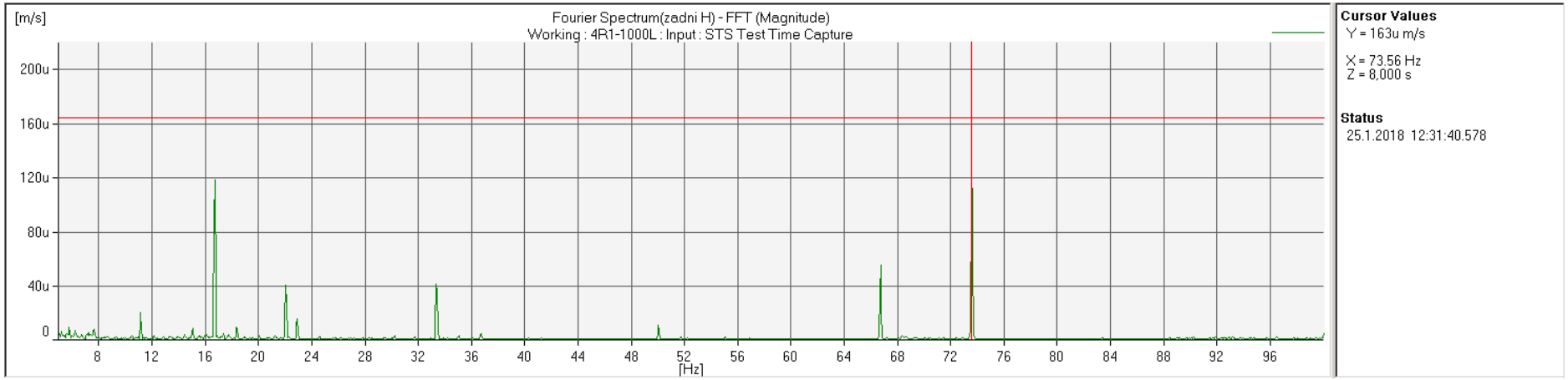
Nejvyssi amplitude na 33,34Hz coz odpovida 2. Otackove frekvenci otackove vretene.



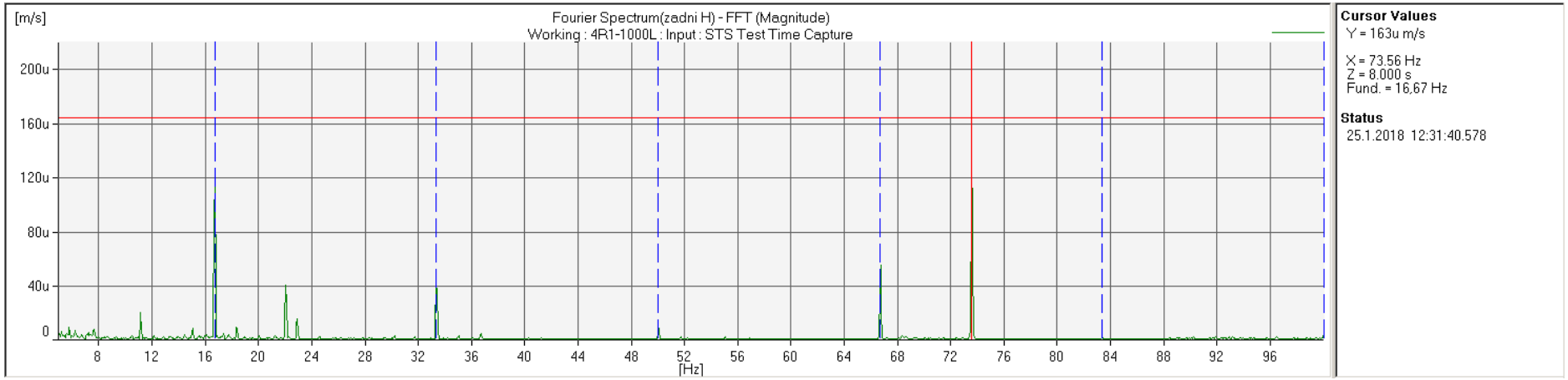
Vyrazna 2. 3. 4. i 5. Otackova otackove vretene

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

4R1-1000L

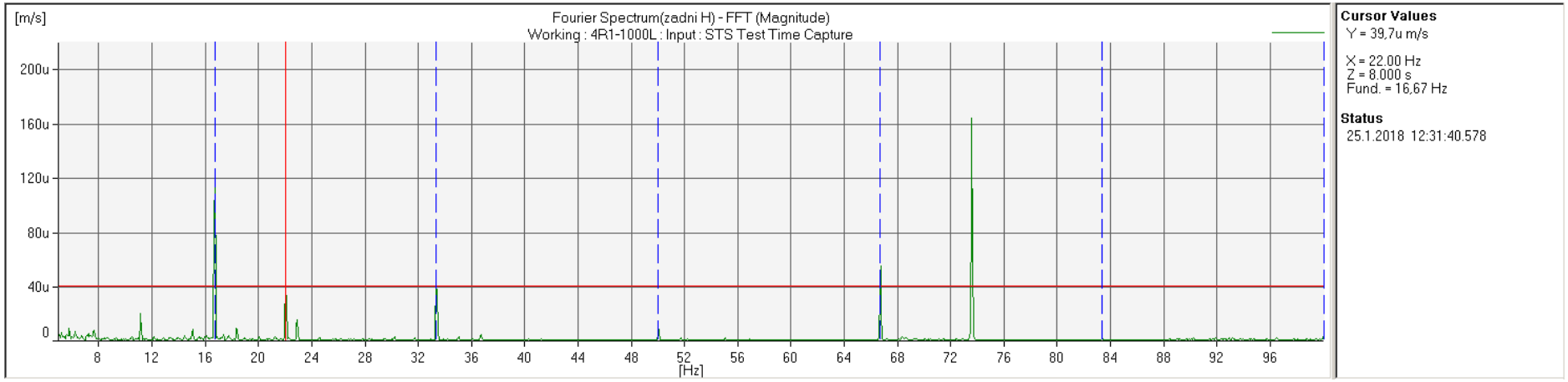


Nejvyssi amplitude na frekvenci 73,56Hz odpovida otackove frekvenci vstupniho hridele A1



Opet vyrazna 1. 2. 3. a 4. Otackova frekvence vretene.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

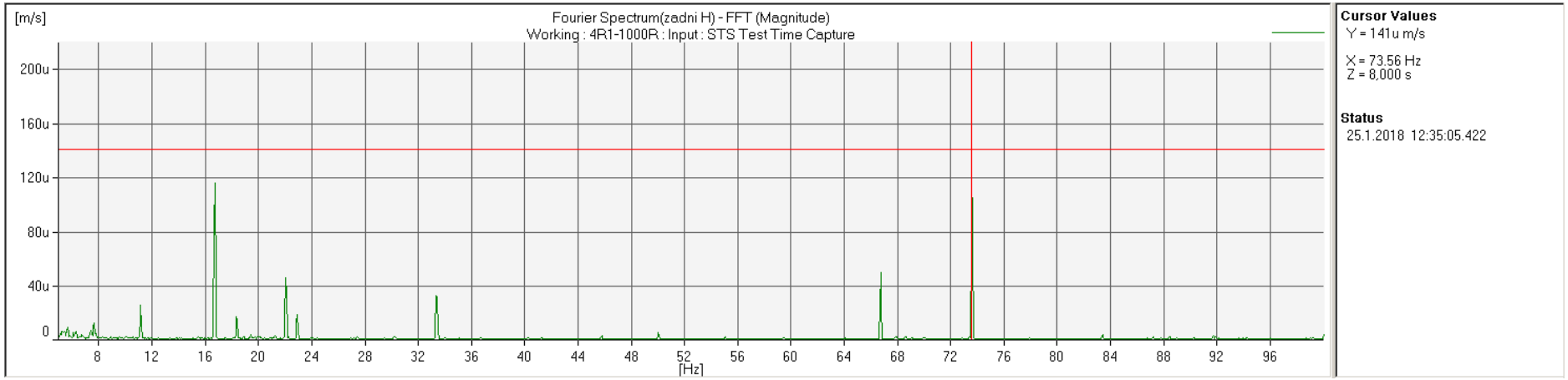


Pozorovatelna rovnez frekvence 22Hz jenz odpovida frekvenci otaceni (protaceni) se ozubeneho kola 54z na hrideli A3 pres ktere netece Mk.

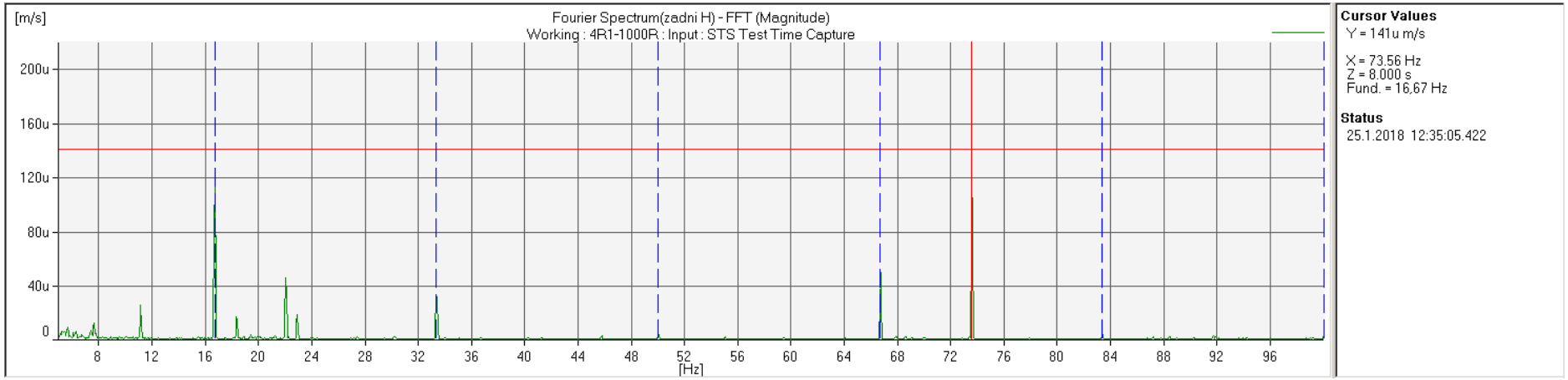
Viditelne jsou take frekvence 11,11Hz (frekvence otaceni hridele A3) a 22,86 (otackova frekvence hridele A2)

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

4R1-1000R



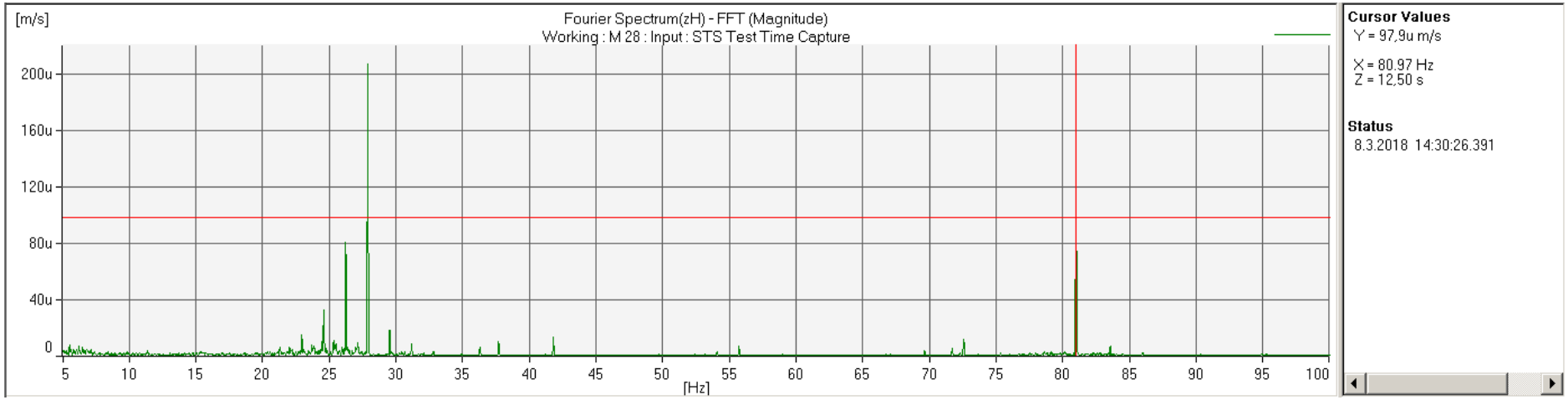
Nejvyssi amplituda na frekvenci 73,56Hz odpovida otackove frekvenci vstupniho hridele A1



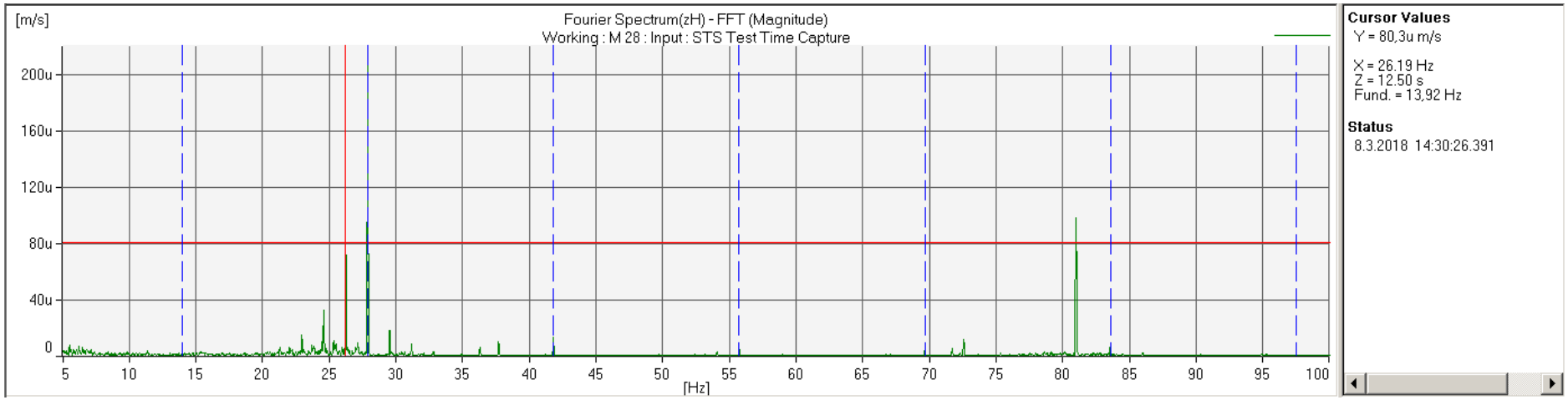
Opet vyrazna 1. 2. a 4. Otackova frekvence vretene. Dale 22Hz, 11,11Hz a 22,86 viz 4R1-1000L

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-835R (1. Rada – otacky motoru 7268.29 ot./ min ; maximalni otacky vretene 1. rady)



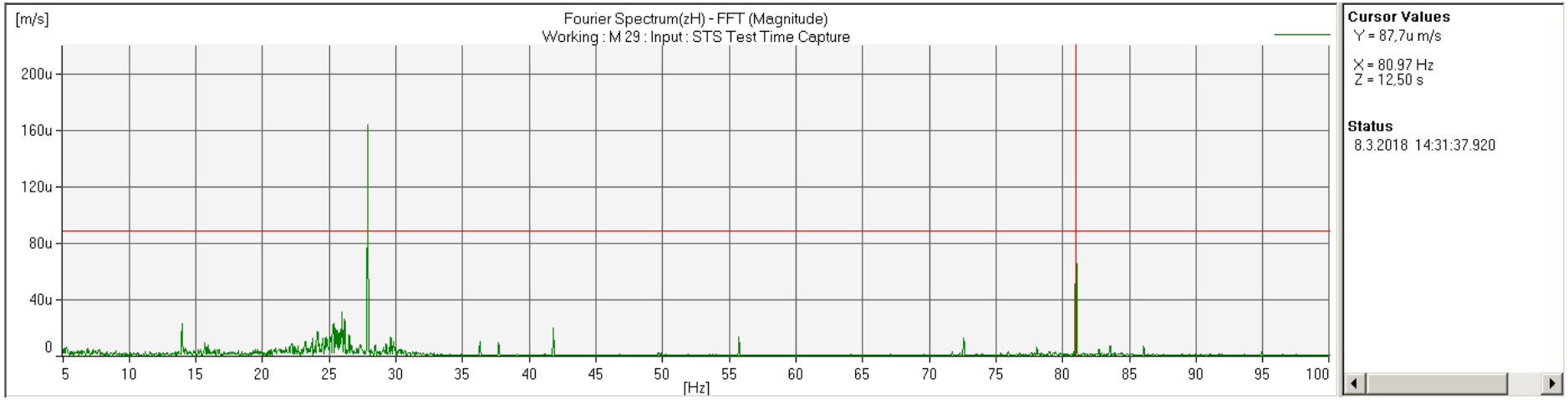
Na frekvenci 80,97Hz a 26,19Hz spicka



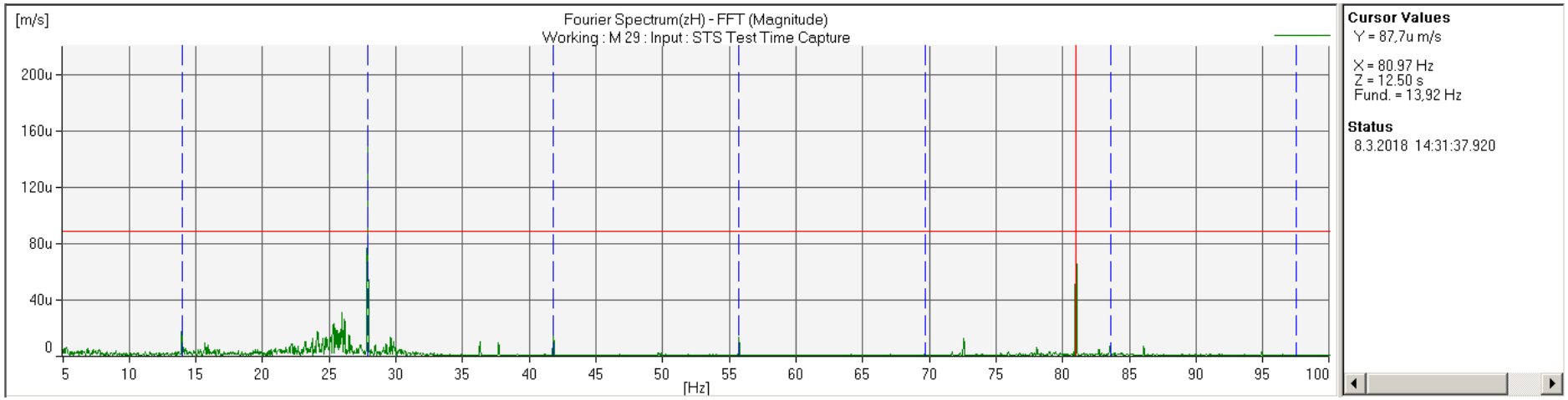
Vyrazna 2. Otackova frekvence vretene.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-835L (1. Rada – otacky motoru 7268.29 ot./min ; maximalni otacky vretene 1. rady)



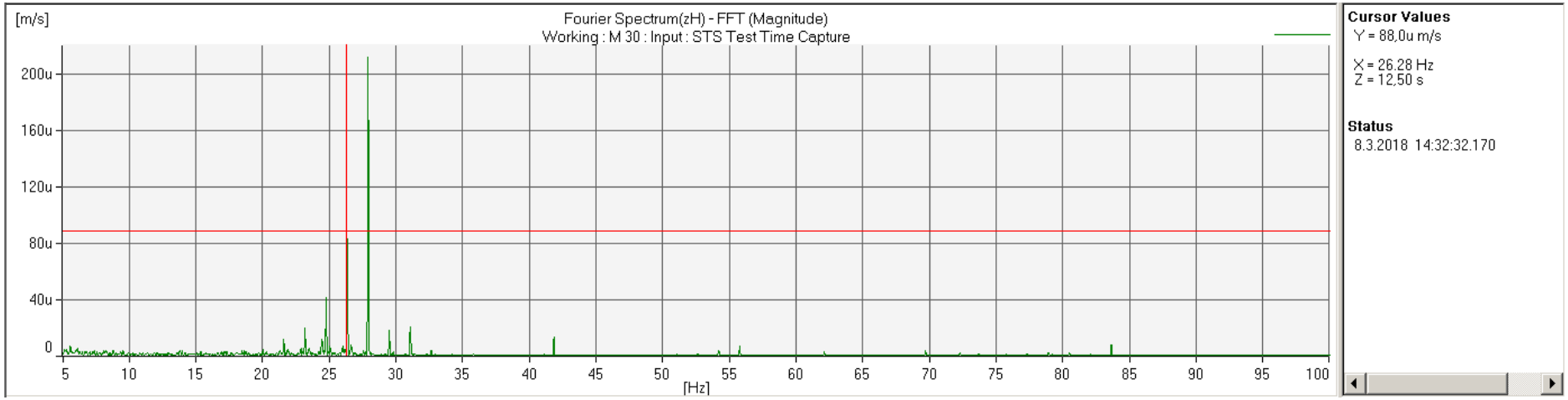
Na frekvenci 80,97Hz spicka



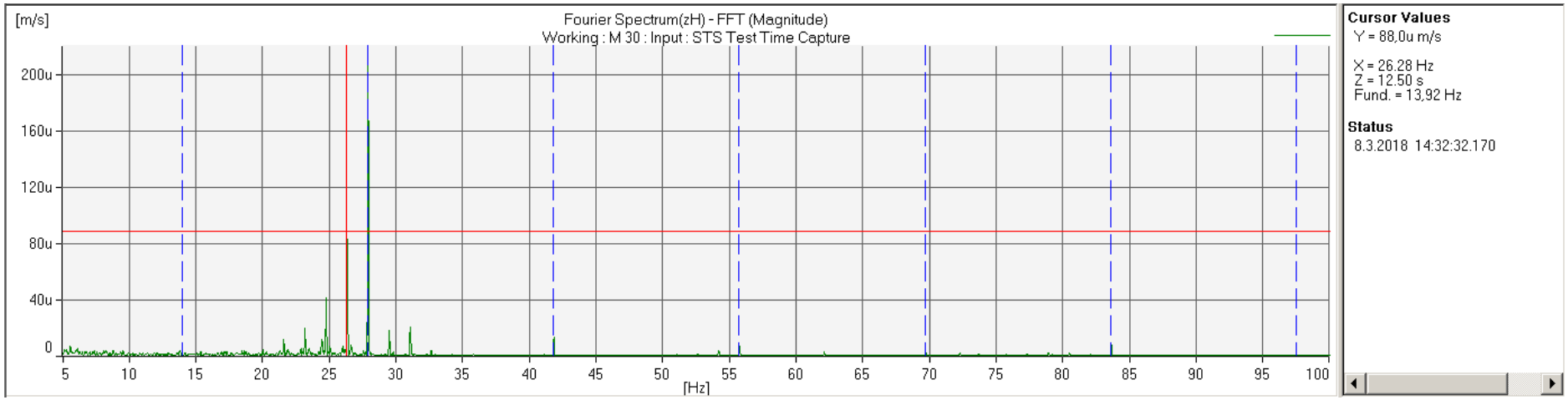
Vyrazna 2. Otackova frekvence vretene.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-836R (2. Rada – otacky motoru 1862.13 ot./min ; minimalni otacky vretene 2. rady)



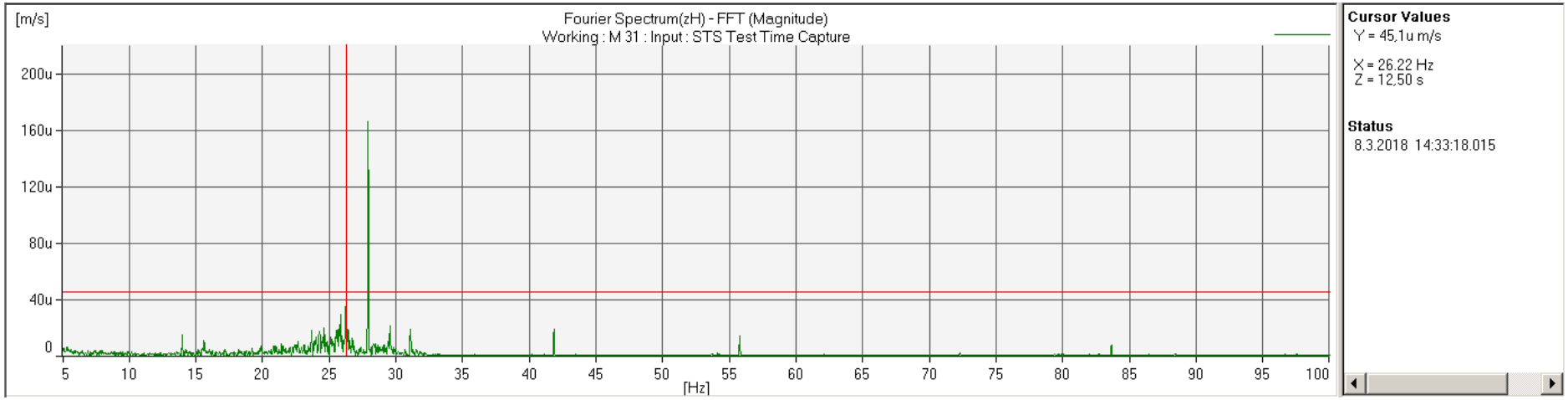
Spicka na frekvenci 26,28Hz

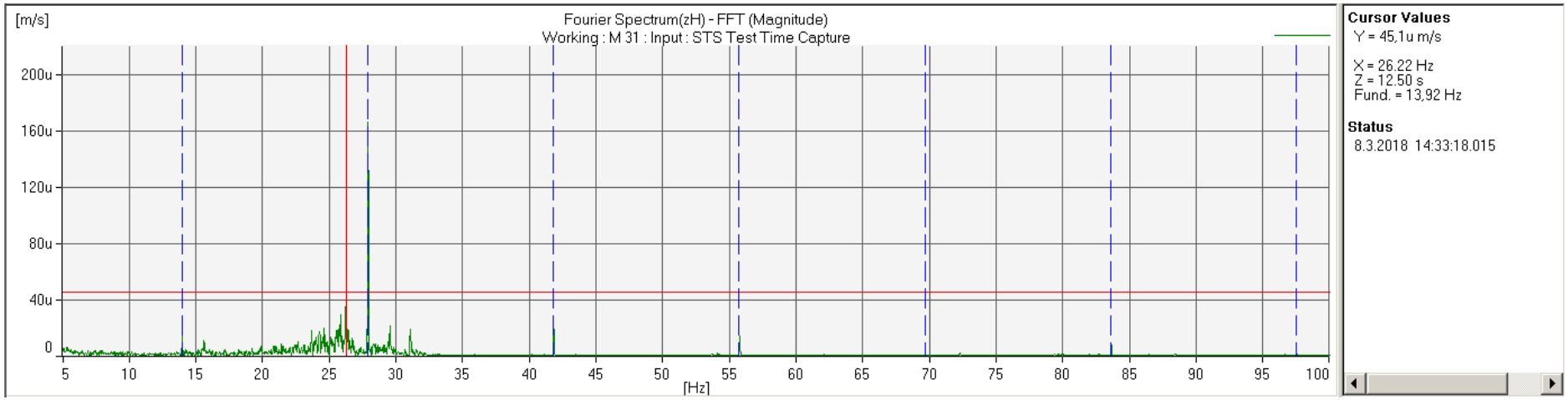


Vyrazna 2. Otackova frekvence vretene.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-836L (2. Rada – otacky motoru 1862.13 ot./min ; minimalni otacky vretene 2. rady)

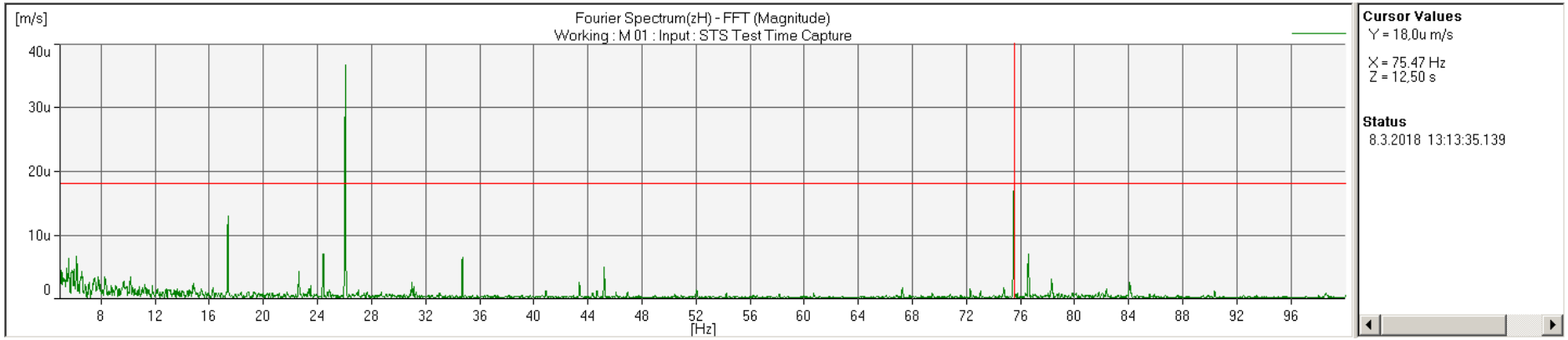




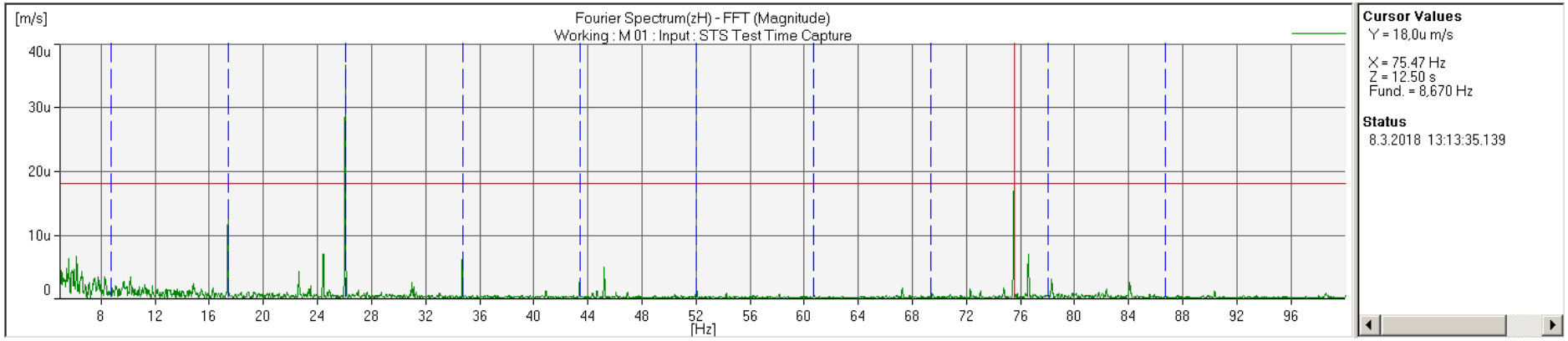
Vyrazna 2. a 3. Otackova frekvence vretene.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-520R (1. Rada – otacky motoru 4527 ot./min)



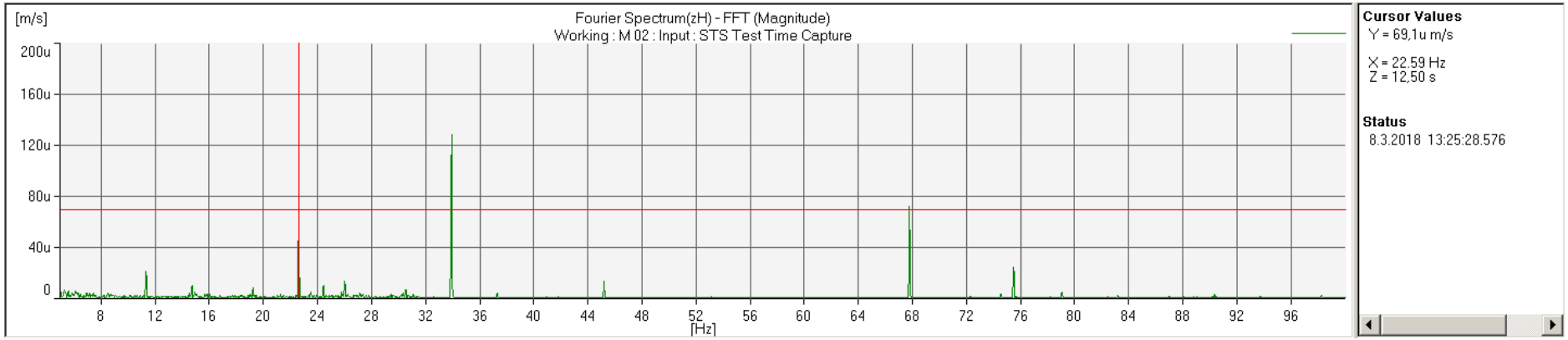
Spicka na 75,47Hz odpovida otackove hridele A1 (75,44Hz)



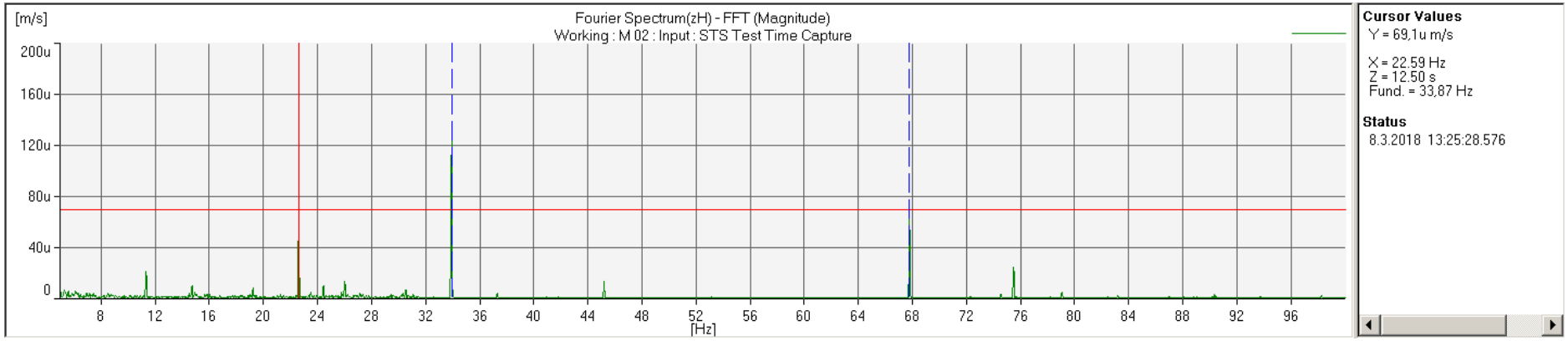
Vyrazna 2. 3. A 4. Otackova frekvence vretene

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

2R3-2032R (2. Rada – otacky motoru 4527 ot./min)



Spicka na 22,59Hz odpovida otackove hridele A3 (22,58Hz)



Vyrazna 1. A 2. Otackova frekvence vretene

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

Porovnani techto spekter

2R3-835L (1. Rada – otacky motoru 7268.29 ot./min ; maximalni otacky vretene 1. rady)

2R3-835R (1. Rada – otacky motoru 7268.29 ot./ min ; maximalni otacky vretene 1. rady)

2R3-836R (2. Rada – otacky motoru 1862.13 ot./min ; minimalni otacky vretene 2. rady)

2R3-836L (2. Rada – otacky motoru 1862.13 ot./min ; minimalni otacky vretene 2. rady)

2R3-520R (1. Rada – otacky motoru 4527 ot./min)

2R3-2032R (2. Rada – otacky motoru 4527 ot./min)

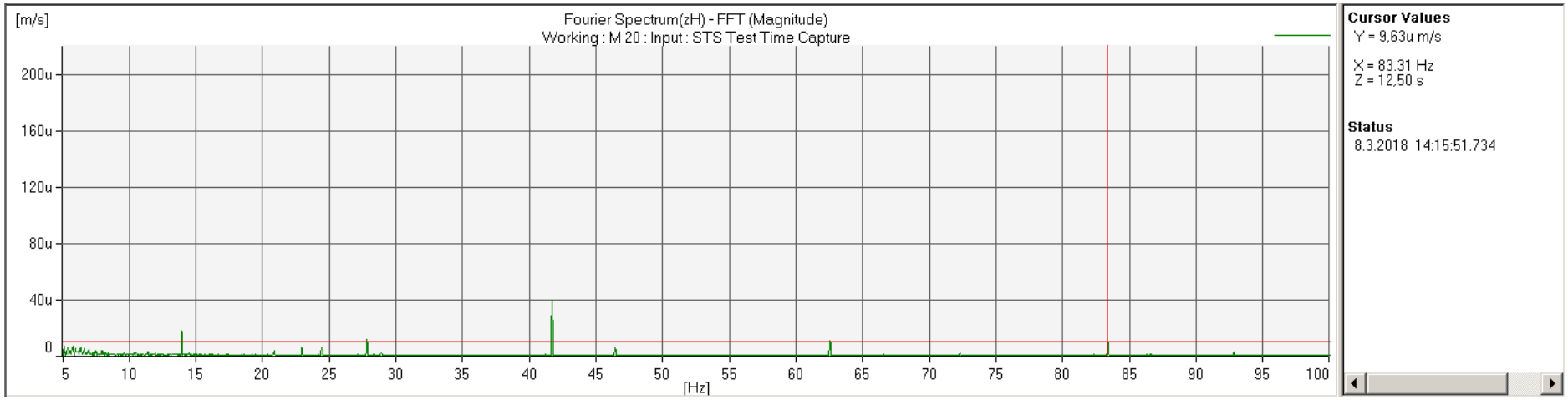
U spekter 2R3-835L, 2R3-835R a 2R3-836R, 2R3-836L tedz u otacek ktere jsou si nejblize co se tyce zarazeni ruznych prevodovych stupnu u 2-radeho vreteniku se harmonicke nasobky pozorovane frekvence vyskytuji na totoznych frekvencich. A to i za predpokladu, ze pri zarazeni ruznych prevodovych stupnu se 3/5 prevodovky otaci odlisnym rychlostmi.

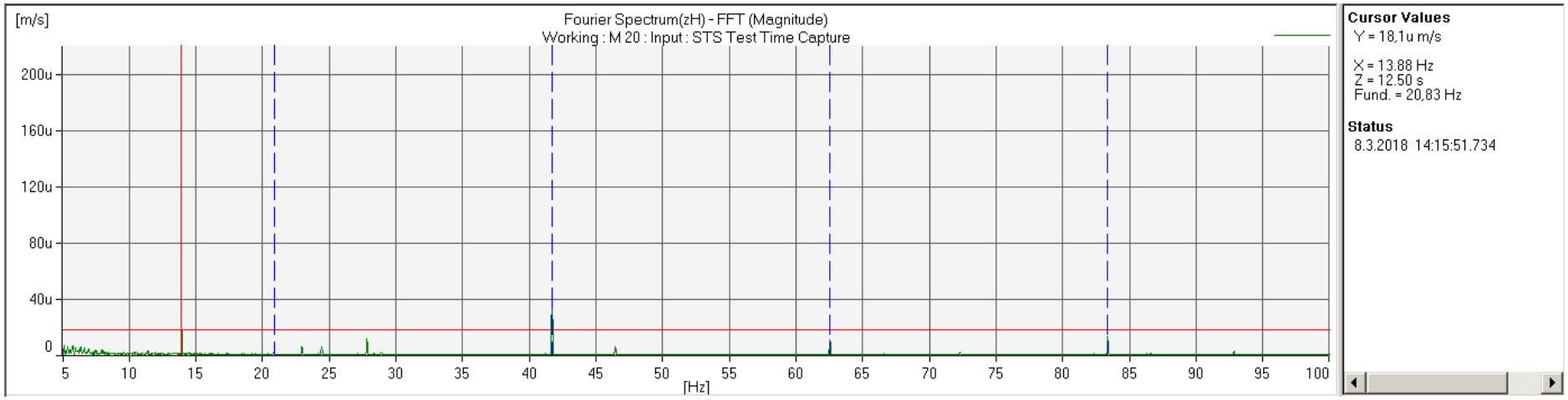
U spekter 2R3-520R a 2R3-2032R kde jsou nastaveny vystupni otacky vreteniku tak, aby pro 1. I 2. Prevodovy stupen 2-radeho vreteniku byly totozne vstupni otacky elektromotoru a 3/5 prevodovky se tak otaci stejne, jsou harmonicke nasobky sledovane frekvence na odlisnych frekvencich.

Z tohoto zjisteni je patrne, ze se s urcitosti jedna o harmonicke nasobky otackove frekvence vretene.

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

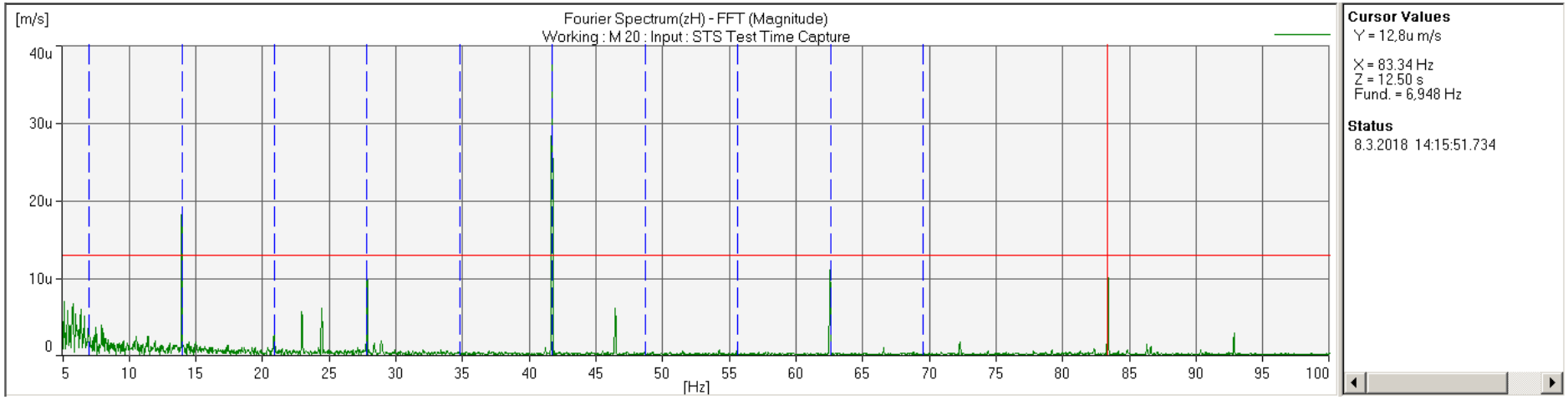
2 R 3 - 1 2 5 0 R





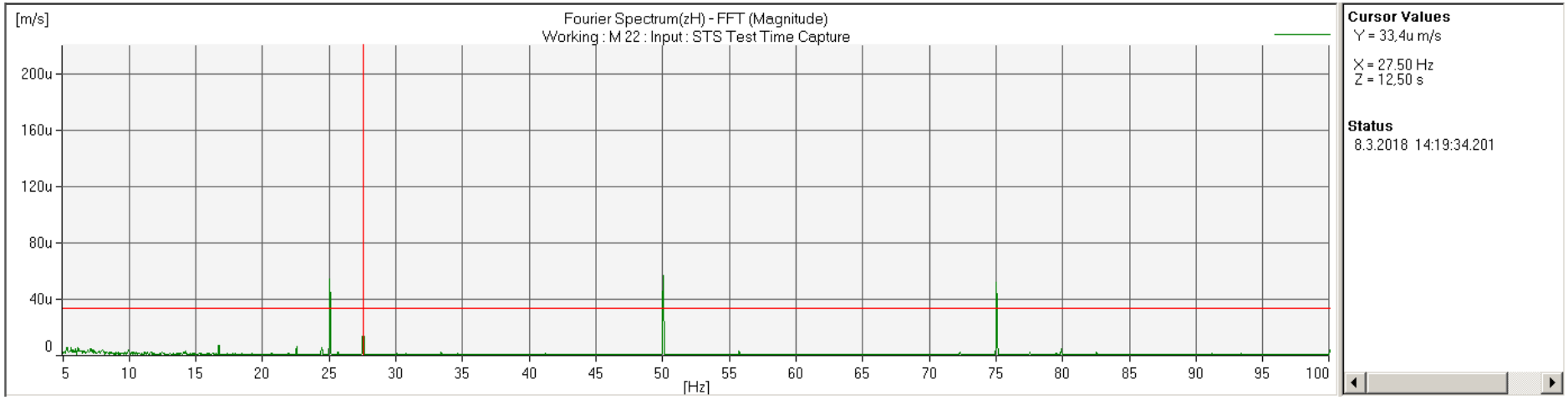
V y r a z n a 2 . H a r m o n i c k a o t a c k o v e v r e t e n e

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz



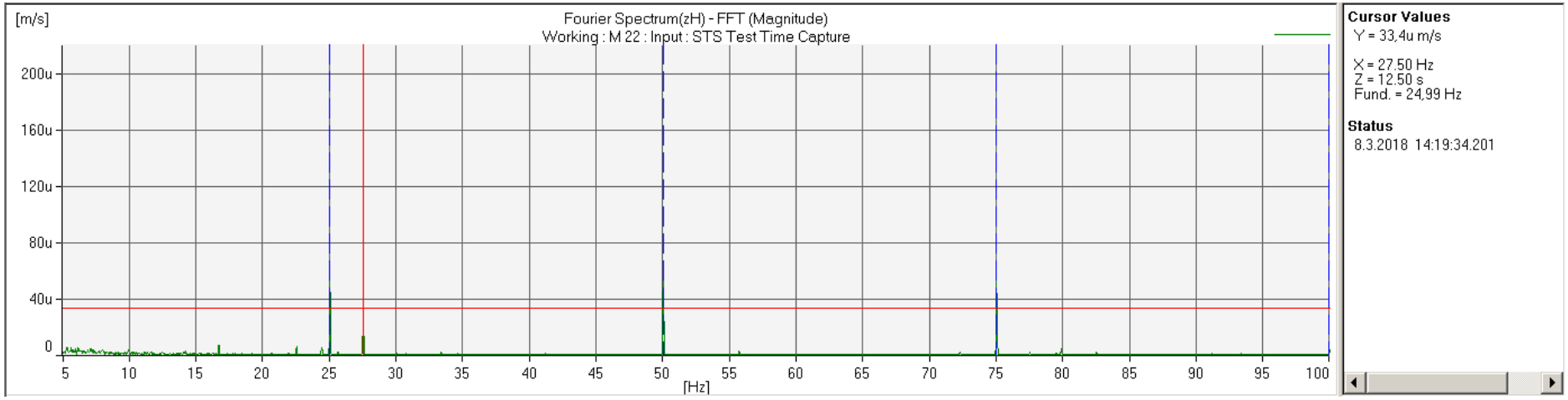
Objevuje se subharmonicka frekvence otackove vretena (20,83Hz). Konkretne 2/3 otackove

2R3-1500R

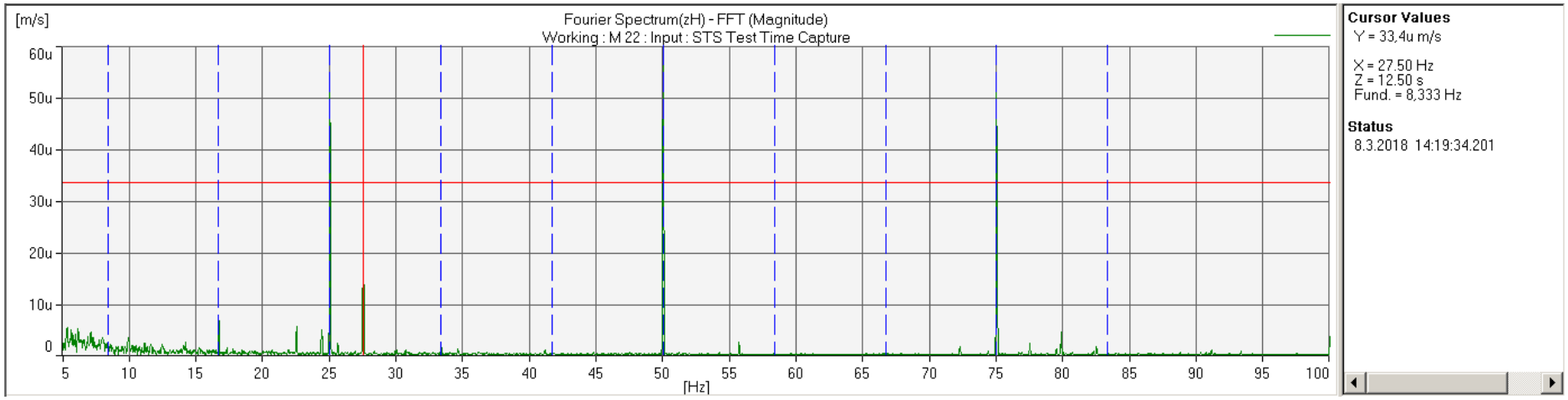


Objevuje se frekvence 27,5Hz odpovidajici otackove hridele A2'

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz



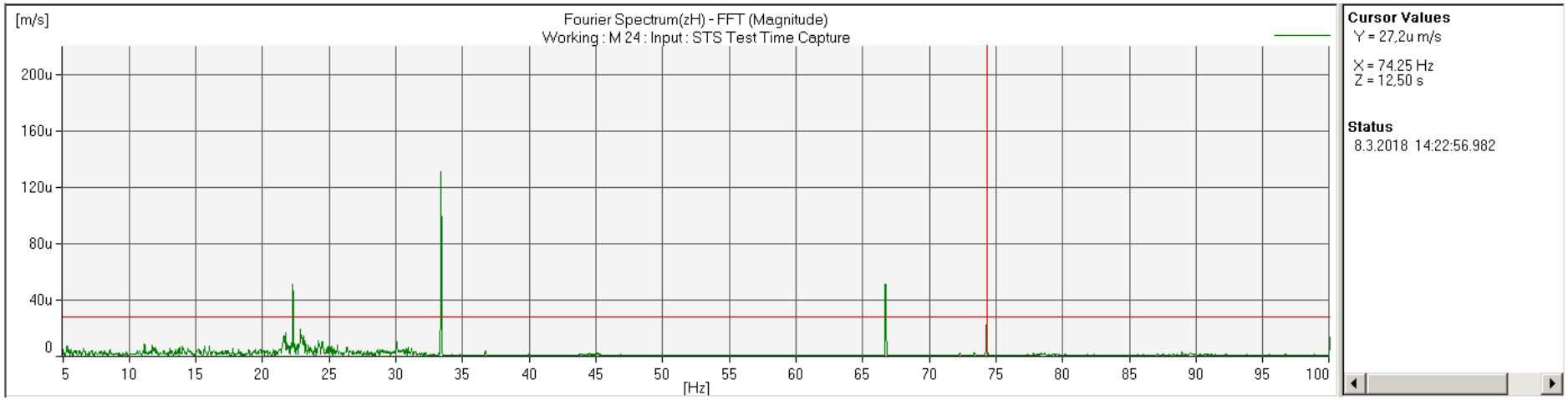
Vyrazna 1. 2. A 3. Otackova frekvence vretene

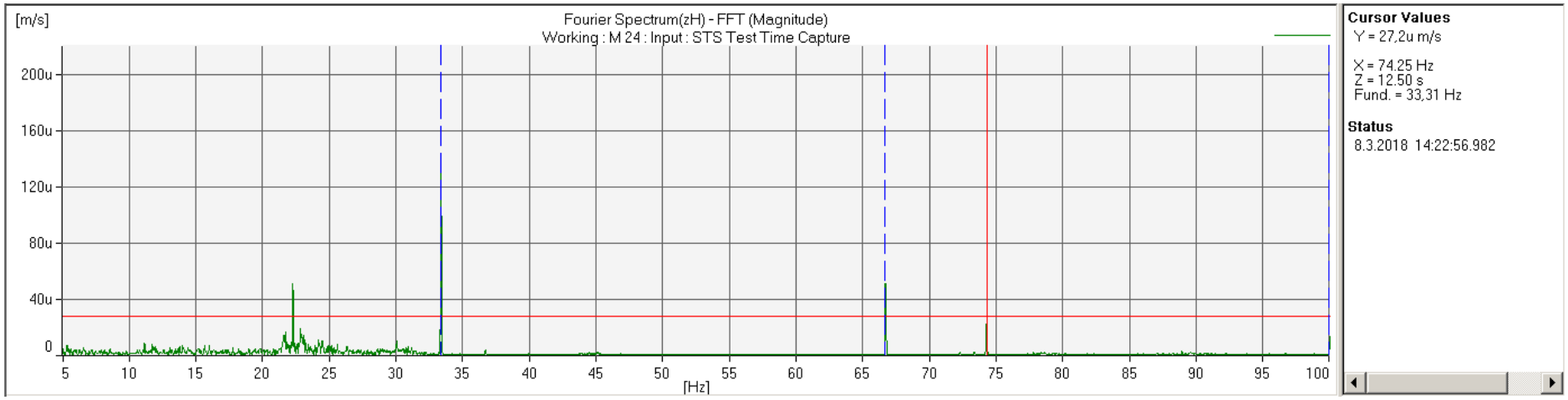


Objevuje se subharmonicka frekvence otackove vretena (25Hz). Konkretne 2/3 otackove

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

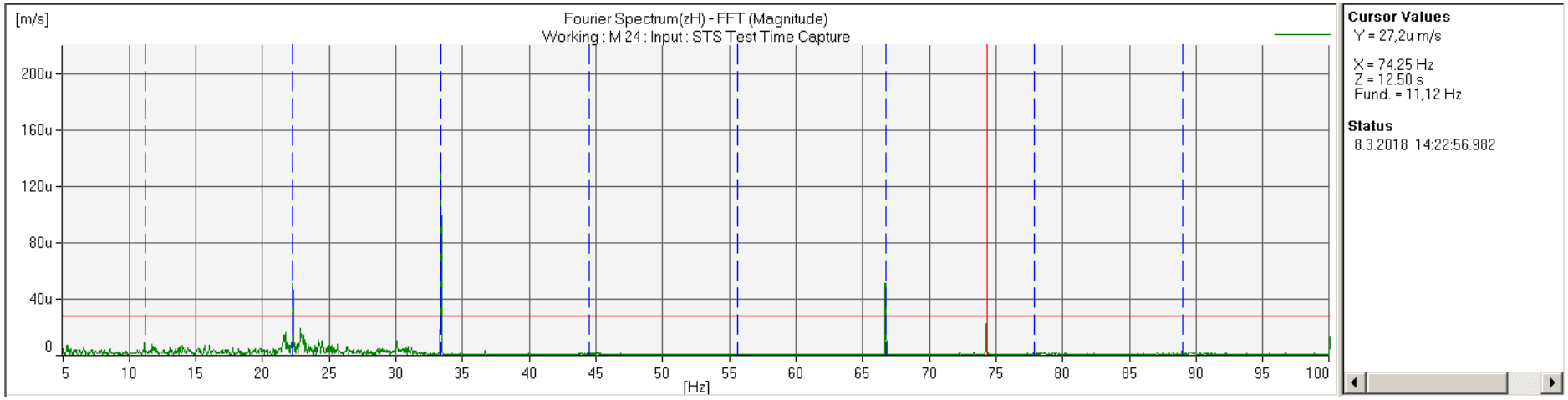
2 R 3 - 2 0 0 0 R





V y r a z n a 1. A 2. H a r m o n i c k a o t a c k o v e

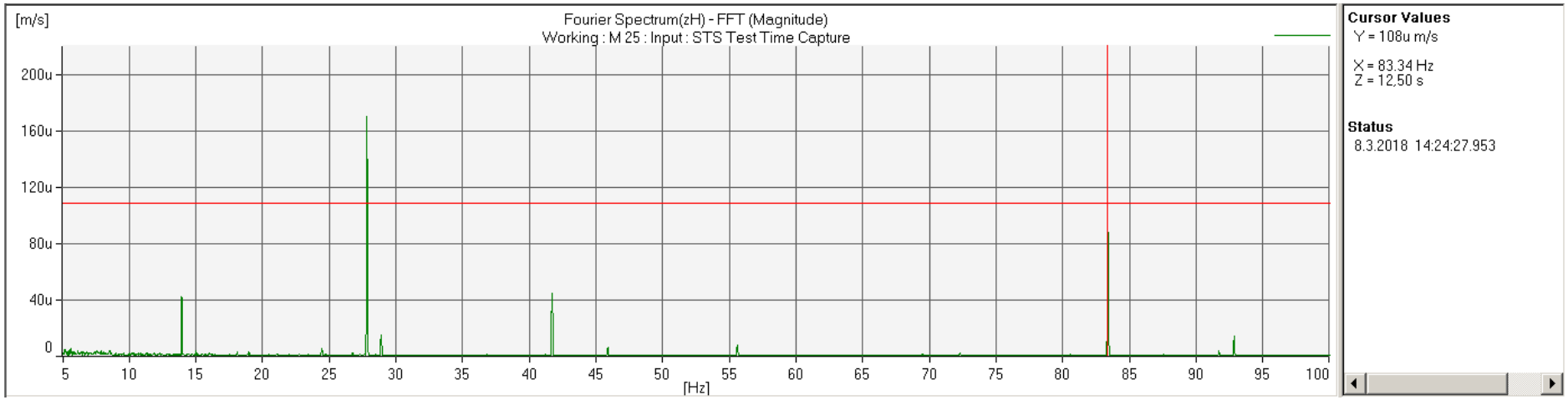
Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

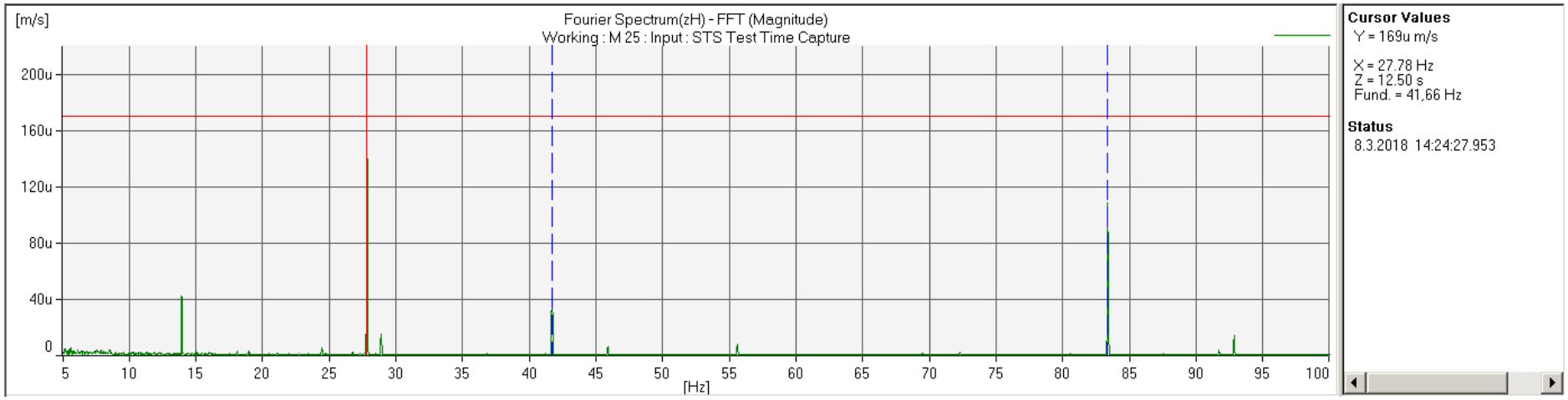


Subharmonicke frekvence otackove vretena (33,33Hz) Konkretne 2/3 harmonicke

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

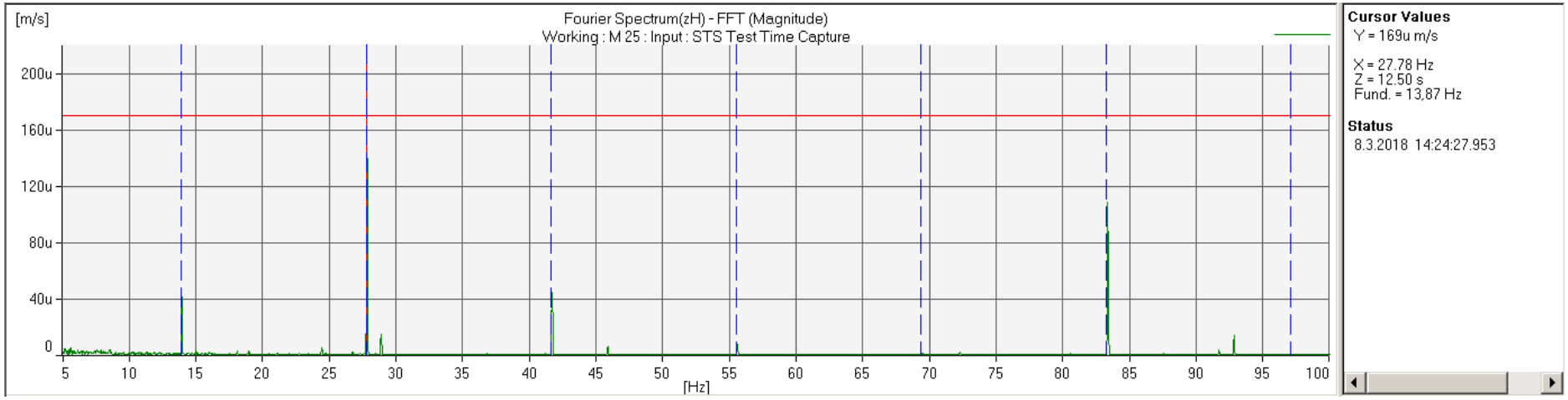
2 R 3 - 2 5 0 0 R





V y r a z n a 1. A 2. H a r m o n i c k a o t a c k o v e v r e t e n e

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz



Subharmonicke frekvence otackove (41,67Hz) Konkretne 1/3 harmonicke

Příloha 9: Spektra rychlosti vibrací v pásmu 0-100Hz

Od 1250 ot./min se zacinaji objevovat subharmonicke frekvence k otackove frekvenci vretena.

Od 1250 pres 1500 az do 2000 otacek se objevuje vzdy pouze amplitude na 2/3 harmonicke frekvence

Pri otackach 2500 se objevi amplitude na 1/3 I 2/3 harmonicke frekvence.

Tyto harmonicke frekvence se objevuji ve vsech namerenych spektrech pri otackach od 1250 a to pri otaceni vretene vpravo I vlevo.