

Staff exchange training at ASTRON 4



From 23rd of July to 3rd of August, 2018 within scope of project “Building on Advanced Lofar Technology for Innovation, Collaboration and Sustainability”, project N0. 692257 – BALTICS) two engineers from Ventspils International Radio Astronomy Centre of Ventspils University of Applied Sciences (VIRAC) attended staff exchange training at project partner institution - Netherlands Institute for Radio Astronomy (ASTRON).

The main goal of the training was to test the possibility to detect location of nearfield radio interference (RFI) source(s) by carrying out imaging sessions with LOFAR LBA array in single station mode.

Additionally the trainees were working on a software defined radio (SDR) and Odroid minicomputer based solution for AM radio station monitoring at LOFAR stations.

These tasks not only allowed the VIRAC staff to learn how to control a LOFAR station on low level but also allowed to increase their knowledge in such interdisciplinary fields as coding in Python and SDR applications.



```

pyrtlsdr_waterfall_Test.py (~/.Dropbox/ASTRON_staff_exchange_jul_2018)
File Edit View Search Tools Documents Help
142
143 # plot entire sweep
144 self.image.set_array(self.image_buffer)
145
146 # restore original center freq.
147 self.sdr.fc = start_fc
148
149 return self.image,
150
151 def start(self):
152     self.update_plot_labels()
153     if sys.platform == 'darwin':
154         # Disable blitting. The matplotlib.animation
155         # method is only implemented for the Agg-
156         # which the macosx backend is not.
157         blit = False
158     else:
159         blit = True
160     ani = animation.FuncAnimation(self.fig, self.u
161     blit=blit)
162
163     pyl.show()
164
165     return
166
167
168 def main():
169     sdr = RtlSdr()
170     wf = Waterfall(sdr)
171
172     # some defaults
173     sdr.rs = 2.4e6
174     sdr.fc = 16.9e6
175     sdr.gain = 20
176     sdr.set_direct_sampling(2)
177
178     wf.start()
179
180     # cleanup
181     sdr.close()
182
183
184 if name == 'main': main()

```

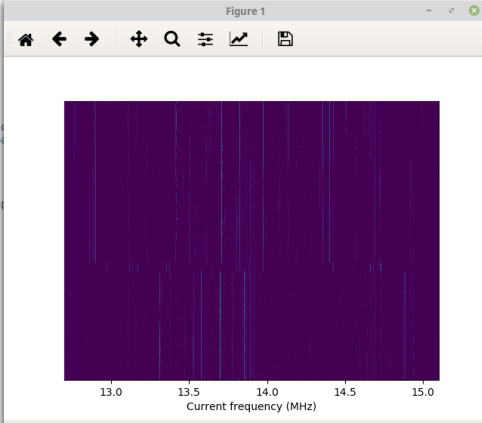


Figure 1
13.0 13.5 14.0 14.5 15.0
Current frequency (MHz)

```

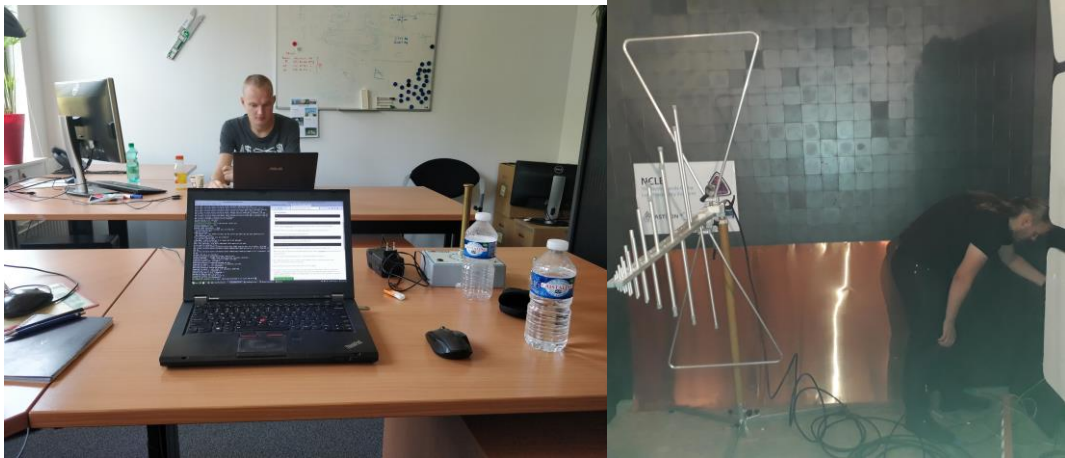
Generating taps for new filter LO:4180 HI:4100 TW:1640 Taps: 141
Generating taps for new filter LO:4080 HI:4000 TW:1600 Taps: 145
Generating taps for new filter LO:3980 HI:3900 TW:1560 Taps: 149
Generating taps for new filter LO:3880 HI:3800 TW:1520 Taps: 153
Generating taps for new filter LO:3780 HI:3700 TW:1480 Taps: 157
Generating taps for new filter LO:3680 HI:3600 TW:1440 Taps: 161
Generating taps for new filter LO:3580 HI:3500 TW:1400 Taps: 165
Generating taps for new filter LO:3480 HI:3400 TW:1360 Taps: 171
Generating taps for new filter LO:3380 HI:3300 TW:1320 Taps: 175
Generating taps for new filter LO:3280 HI:3200 TW:1280 Taps: 181
Generating taps for new filter LO:3180 HI:3100 TW:1240 Taps: 187
Generating taps for new filter LO:3080 HI:3000 TW:1200 Taps: 193
Generating taps for new filter LO:2980 HI:2900 TW:1160 Taps: 199
Generating taps for new filter LO:2880 HI:2800 TW:1120 Taps: 207
Generating taps for new filter LO:2780 HI:2700 TW:1080 Taps: 215
Generating taps for new filter LO:2680 HI:2600 TW:1040 Taps: 223
Generating taps for new filter LO:2580 HI:2500 TW:1000 Taps: 229
Generating taps for new filter LO:2480 HI:2400 TW:960 Taps: 235
Generating taps for new filter LO:2380 HI:2300 TW:920 Taps: 241
Generating taps for new filter LO:2280 HI:2200 TW:880 Taps: 247
Generating taps for new filter LO:2180 HI:2100 TW:840 Taps: 253
Generating taps for new filter LO:2080 HI:2000 TW:800 Taps: 259
Generating taps for new filter LO:1980 HI:1900 TW:760 Taps: 265
Generating taps for new filter LO:1880 HI:1800 TW:720 Taps: 271
Generating taps for new filter LO:1780 HI:1700 TW:680 Taps: 277
Generating taps for new filter LO:1680 HI:1600 TW:640 Taps: 283
Generating taps for new filter LO:1580 HI:1500 TW:600 Taps: 289
Generating taps for new filter LO:1480 HI:1400 TW:560 Taps: 295
Generating taps for new filter LO:1380 HI:1300 TW:520 Taps: 301
Generating taps for new filter LO:1280 HI:1200 TW:480 Taps: 307
Generating taps for new filter LO:1180 HI:1100 TW:440 Taps: 313
Generating taps for new filter LO:1080 HI:1000 TW:400 Taps: 319
Generating taps for new filter LO:980 HI:900 TW:360 Taps: 325
Generating taps for new filter LO:880 HI:800 TW:320 Taps: 331
Generating taps for new filter LO:780 HI:700 TW:280 Taps: 337
Generating taps for new filter LO:680 HI:600 TW:240 Taps: 343
Generating taps for new filter LO:580 HI:500 TW:200 Taps: 349
Generating taps for new filter LO:480 HI:400 TW:160 Taps: 355
Generating taps for new filter LO:380 HI:300 TW:120 Taps: 361
Generating taps for new filter LO:280 HI:200 TW:80 Taps: 367
Generating taps for new filter LO:180 HI:100 TW:40 Taps: 373
Generating taps for new filter LO:80 HI:0 TW:0 Taps: 379

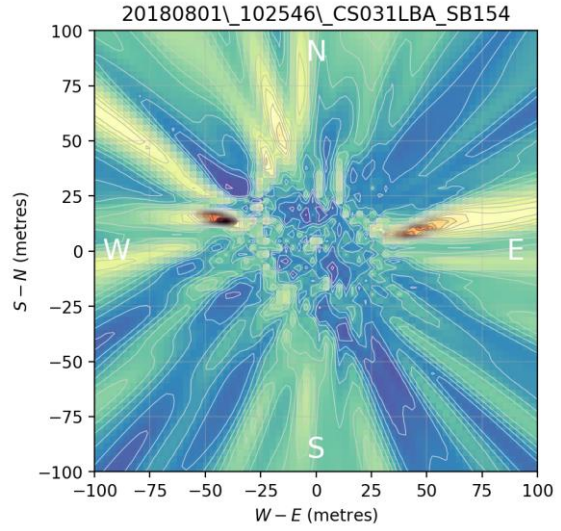
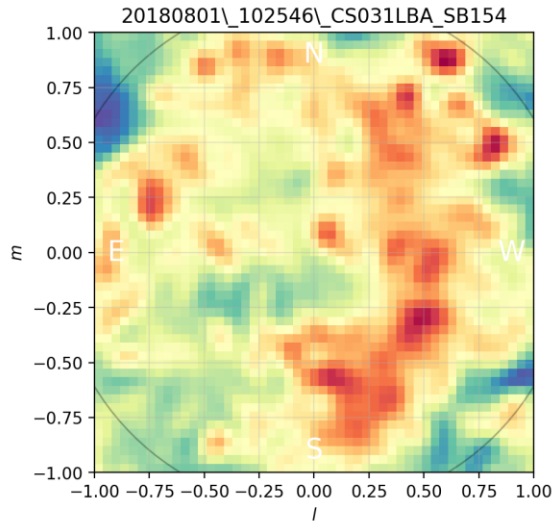
```

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New FFT rate: 60 Hz
marcis@marcis-ThinkPad-T430:~/Dropbox/ASTRON_staff_exchange_jul_2018$ python pyrtlsdr_waterfall_Test.py
Found Rafael Micro R820T tuner
[R82XX] PLL not locked!
Enabled direct sampling mode, input 2

```





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VIRAC

VENTSPILS AUGSTSKOLA

ASTRON



The University of Manchester

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