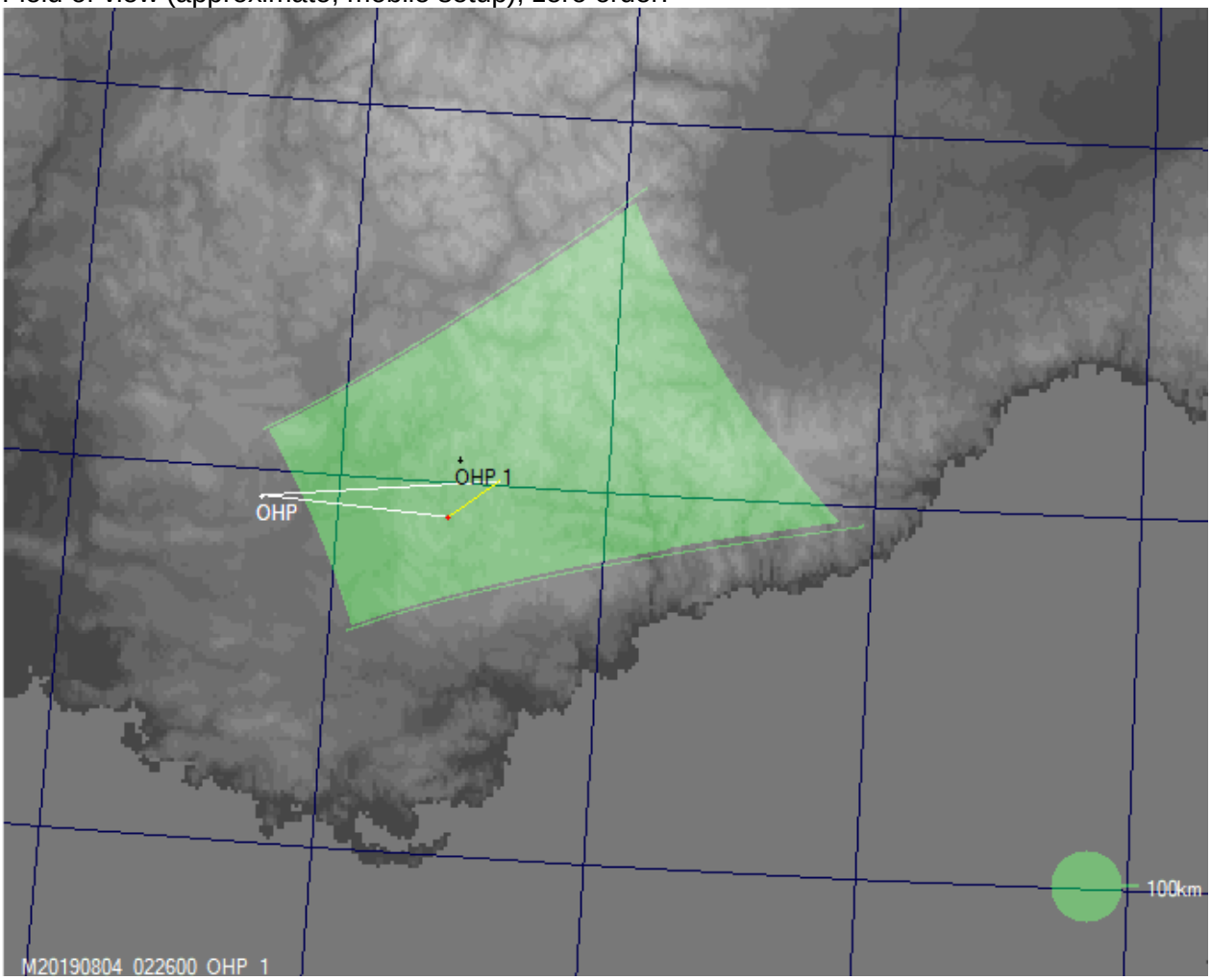
Meteor spectra 201908, OHP

Overview

Meteor spectrum obtained at OHP spectroscopy workshop, with a Watec 902H2 ultimate lens Tamron VG412 ASIR
Field of view (approximate, mobile setup), zero order:



Spectrum analyzed with Python m_pype62.py

M20190804_022600_OHP_1, PER, -3.8m

Registered images:

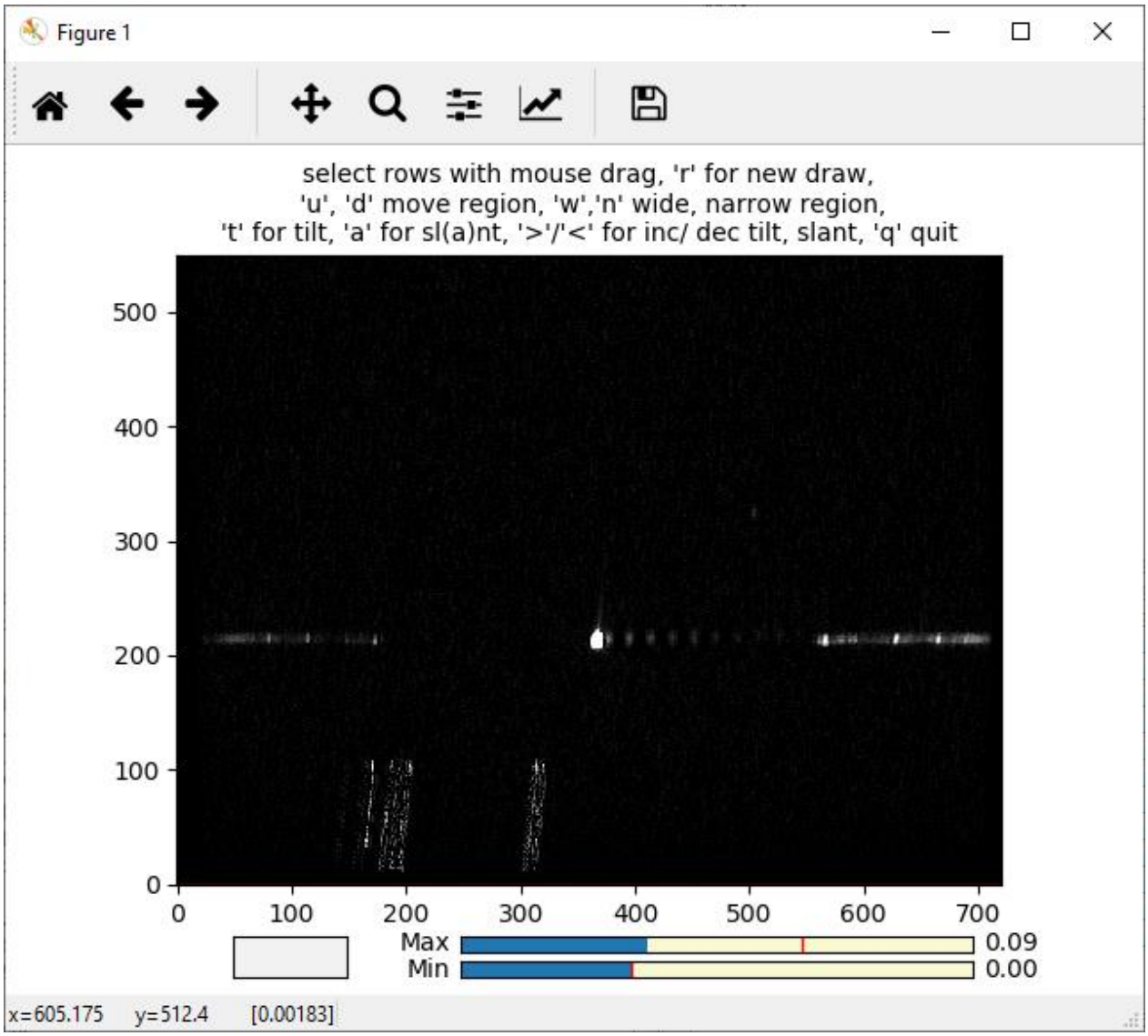
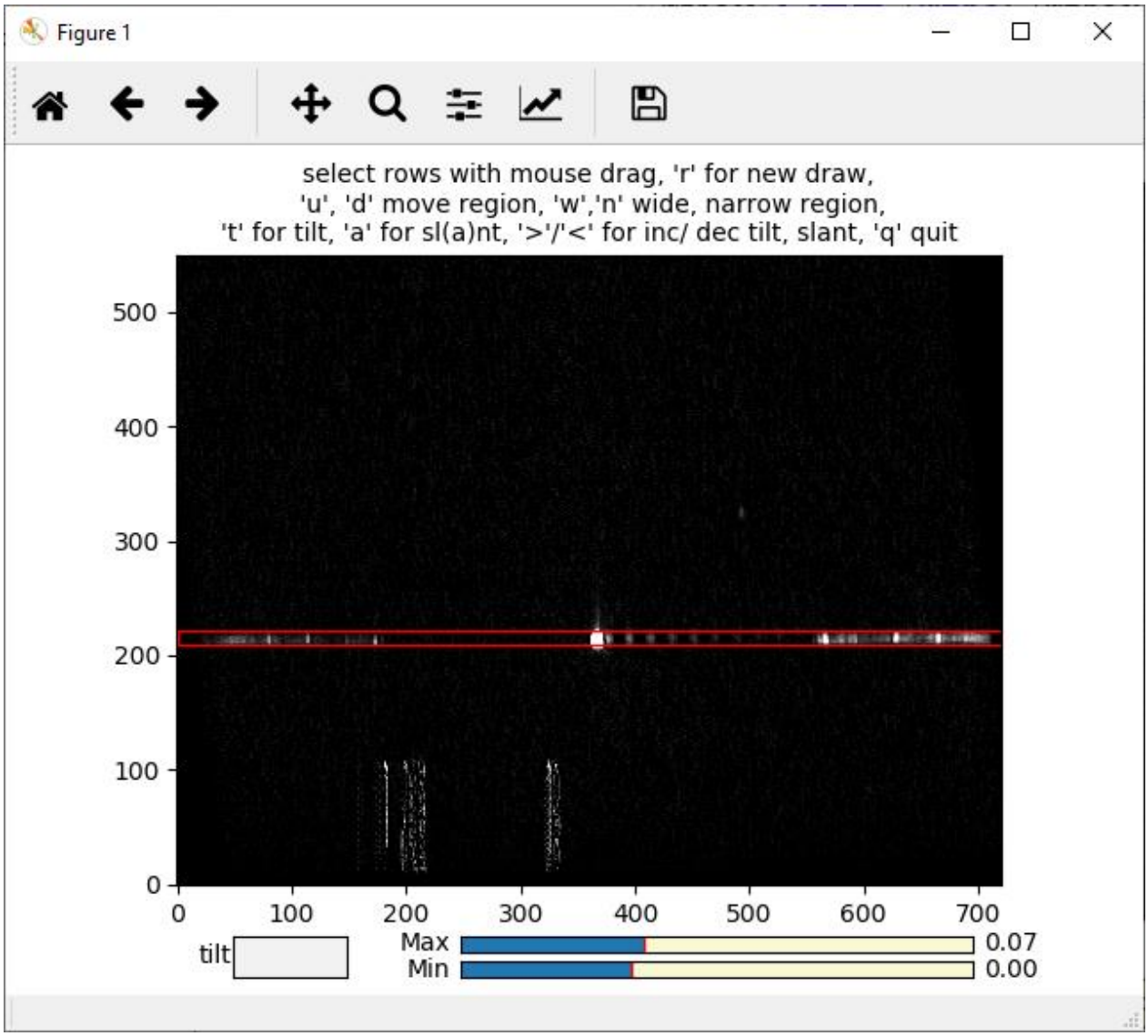
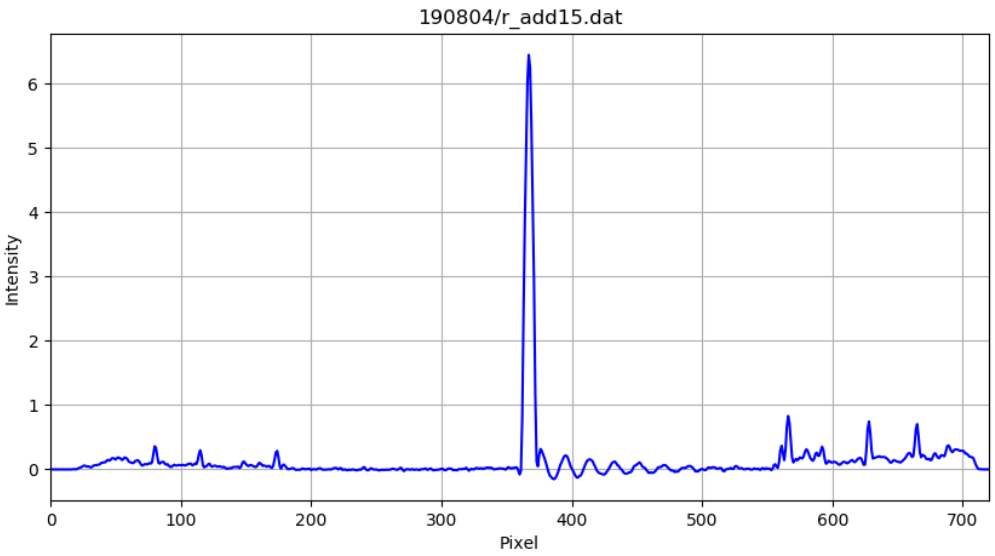


Figure 1
select rows with mouse drag, 'r' for new draw,
'u', 'd' move region, 'w','n' wide, narrow region,
't' for tilt, 'a' for sl(a)nt, '>'/'<' for inc/ dec tilt, slant, 'q' quit
500
400
300
200
100
0
0
100
200
300
400
500
600
700
Max
Min
0.09
0.00
x=605.175
y=512.4
[0.00183]



Tilt angle and slant corrected, rows selected

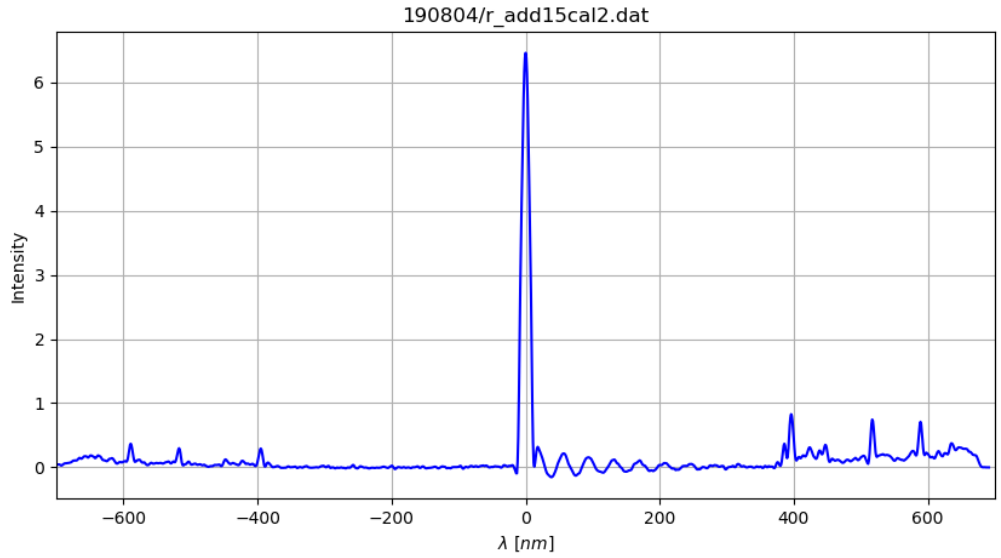


Raw spectrum, uncalibrated

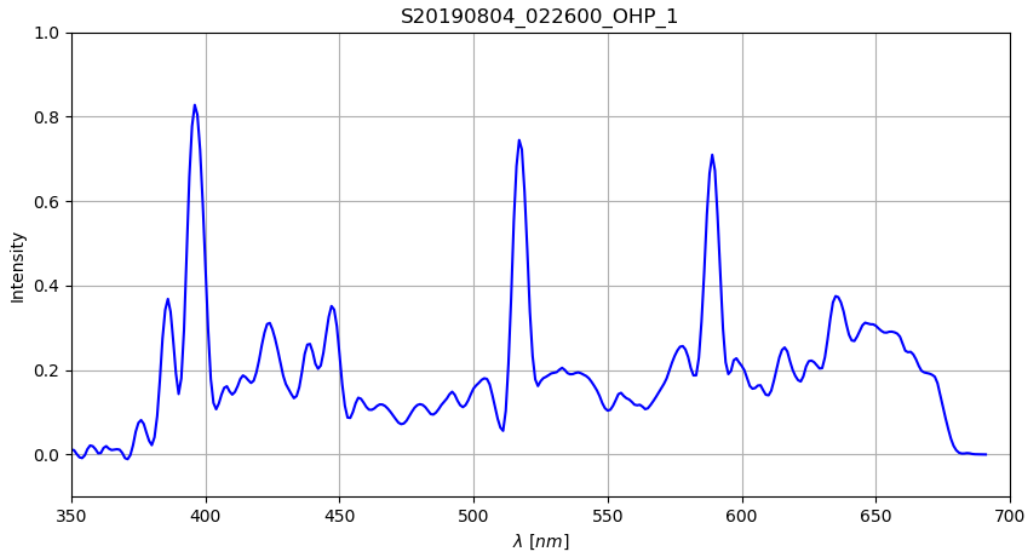
Result of calibration
(2nd order fit, because grating was moved since last calibration, transport to OHP)
polynom for fit lambda c: [-1.280e-04 2.111e+00 -7.580e+02]

pixel	lambda	fit	error
80.31,	-589.00,	-589.23,	-0.2285
114.82,	-517.50,	-517.23,	0.2696
367.16,	0.00,	-0.04,	-0.0378
627.98,	517.50,	517.41,	-0.0936
664.82,	589.00,	589.09,	0.0904

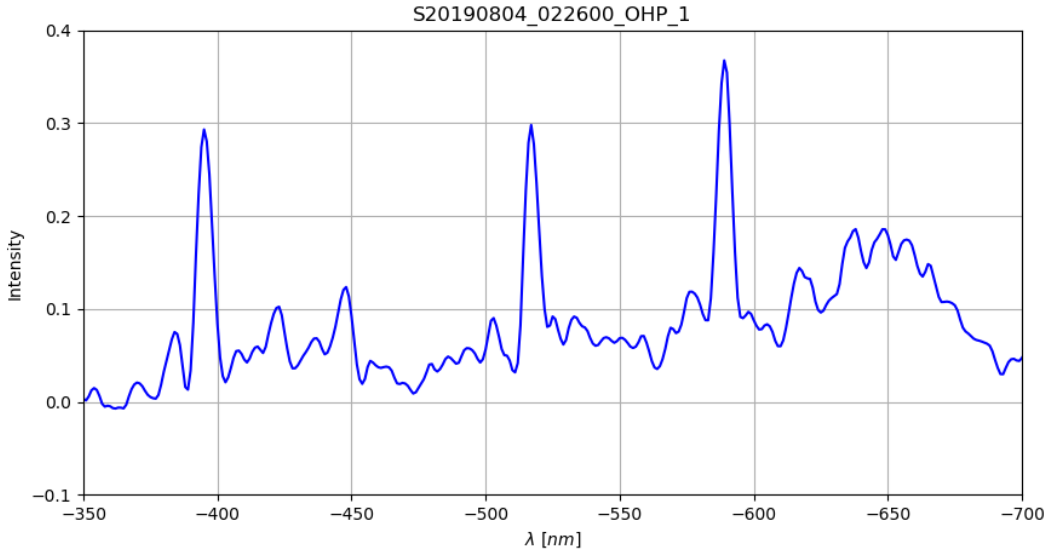
rms_x = 0.1693
spectrum 190804/r_add15cal.dat saved



The ripple between 0 and 200 nm is caused by electronic noise (cable).



First order spectrum, not corrected for instrument response



Negative first order (wrong side of zero order)

You may assign the lines of the spectrum with help of the following list of meteor spectral lines. Note that the resolution of the spectrum is not high enough to resolve all the lines, but you may identify Mg, Ca, Fe, Na lines
373 nm Fe I
383 nm Mg I
395 nm Ca II
425 nm Ca I, Cr I, Fe I
438 nm Fe I
448 nm Mg II
517.5 nm Mg I
522 – 545 nm Fe I
589 nm Na I
616 nm O I, Ca I
635 nm Si II
649 nm Fe I
656 nm H-alpha

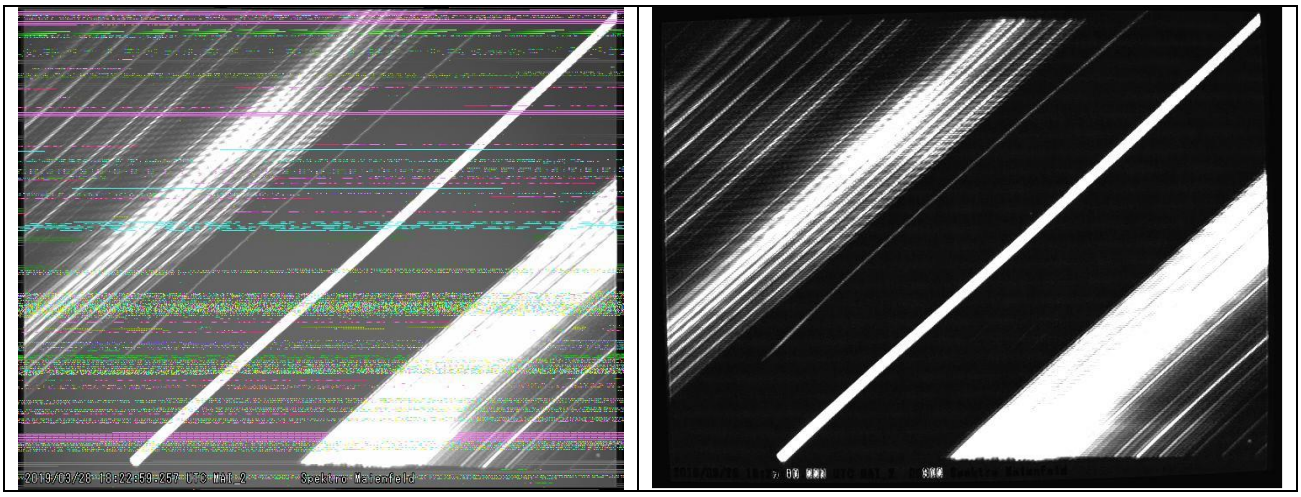
Meteor spectral lines

Table 3-7: List of spectral lines frequently found in meteor spectra and their relative intensities. Th
tification of the lines (numbers) in our example is also given. Lines marked with an asterisk appear b
spectra of fast meteors, such as the Perseids, but much fainter in spectra of slow meteors.

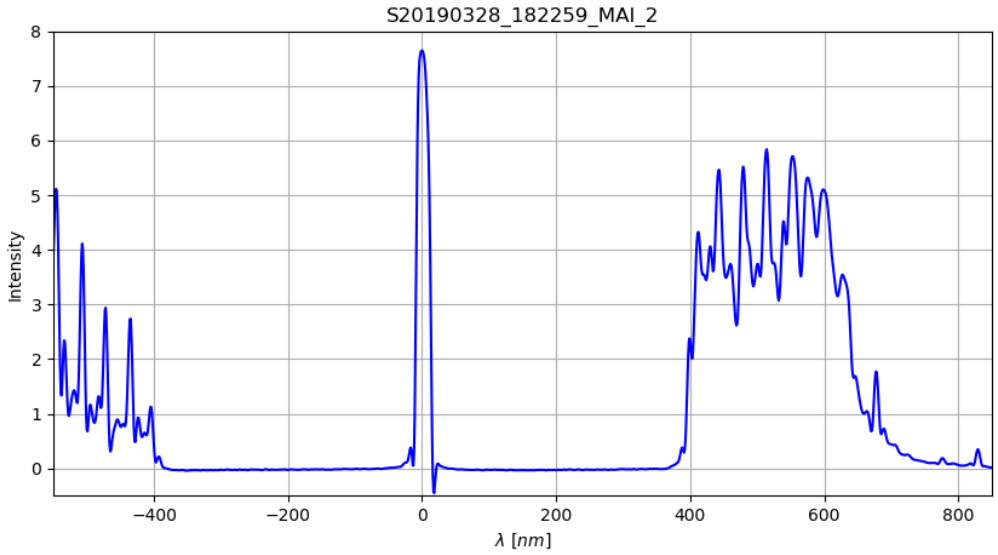
Laboratory data			ident.	Laboratory data			ident.
λ_{lab}, [Å]	atom/ion	intensity	number	λ_{lab}, [Å]	atom/ion	intensity	number
3719.9	Fe	10	2	4923.9	Fe^+	2*	
3734.9	Fe	8		4957.6	Fe	4	
3737.1	Fe	9	3	5012.1	Fe	1	
3745.6	Fe	8		5018.4	Fe^+	3*	
3749.5	Fe	8		5110.4	Fe	1	
3820.4	Fe	9		5167.3	Mg	17	
3825.9	Fe	8		5172.7	Mg	25	
3829.4	Mg	10		5183.6	Mg	28	
3832.3	Mg	11		5208.4	Cr	10	
3838.3	Mg	12		5227.2	Fe	5	
3859.9	Fe	11		5269.5	Fe	14	
3886.3	Fe	9		5328.0	Fe	12	
3933.7	Ca^+	40*	8	5371.5	Fe	9	
3968.5	Ca^+	35*	9	5397.1	Fe	5	
4030.8	Mn	10		5405.8	Fe	6	
4045.8	Fe	10		5429.7	Fe	6	
4063.6	Fe	9		5434.5	Fe	4	
4131.0	Si^+	1*		5446.9	Fe	4	
4226.7	Ca	11	12	5455.6	Fe	4	
4254.4	Cr	9		5528.4	Mg	2	
4271.8	Fe	10		5615.7	Fe	1	
4274.8	Cr	8		5890.0	Na	40	
4289.7	Cr	7		5895.9	Na	35	
4307.9	Fe	10		6156.8	O	1*	
4325.8	Fe	10		6162.2	Ca	1	
4383.5	Fe	14	15	6347.1	Si^+	6*	
4404.8	Fe	11		6371.4	Si^+	3*	
4481.2	Mg^+	15*		6495.0	Fe	1	
4920.5	Fe	3		6562.9	H	2*	

Spectral lines, (IMO PhotographicHandbook 03 Spectra, p 47)
http://www.imo.net/docs/03spectra.pdf

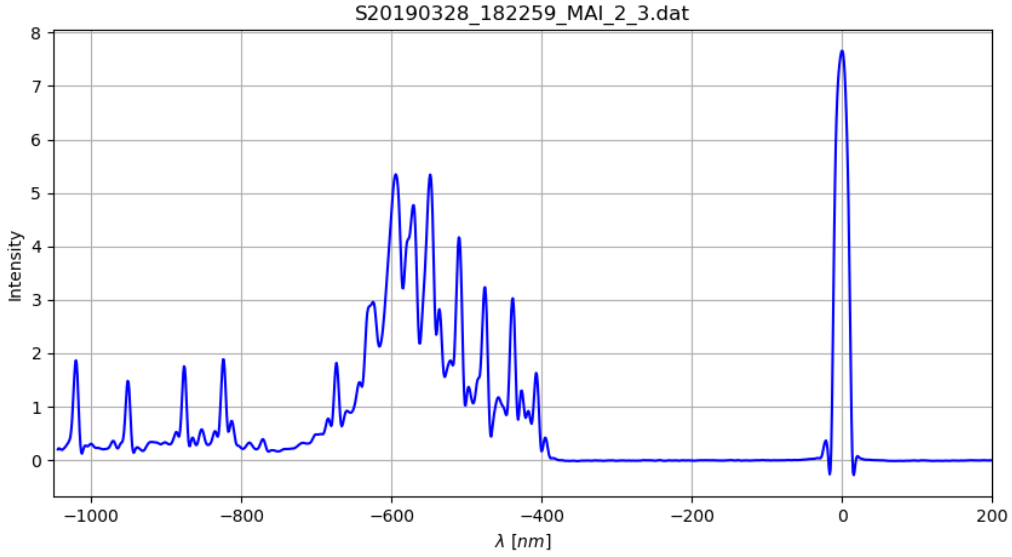
M20190328_182259_MAI_2, airplane, -5.4m



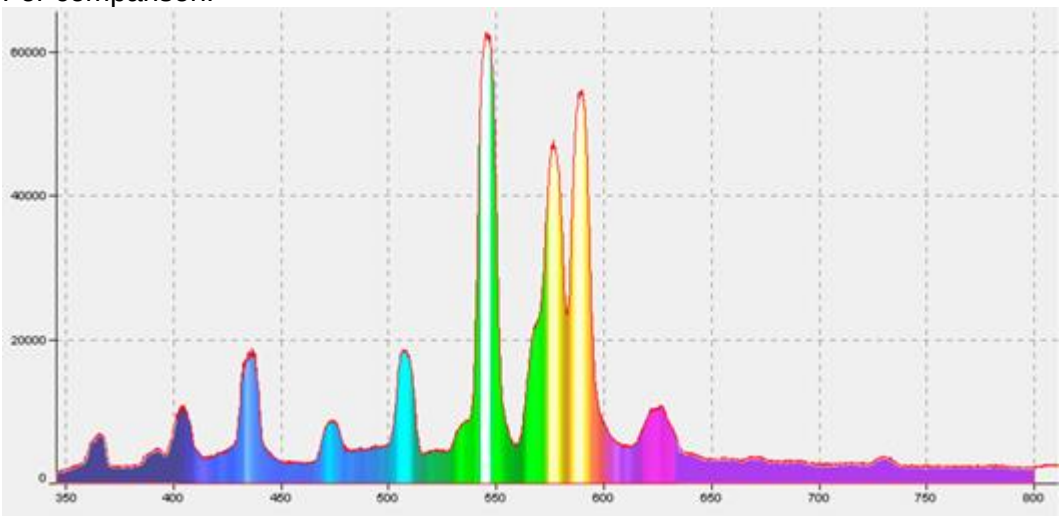
First frame with large noise
r2_add100:



r3_add60:



For details see ..\..\..\Python\190328\m_pipe190329.log
For comparison:



From: http://www.wikiwand.com/en/Metal-halide_lamp