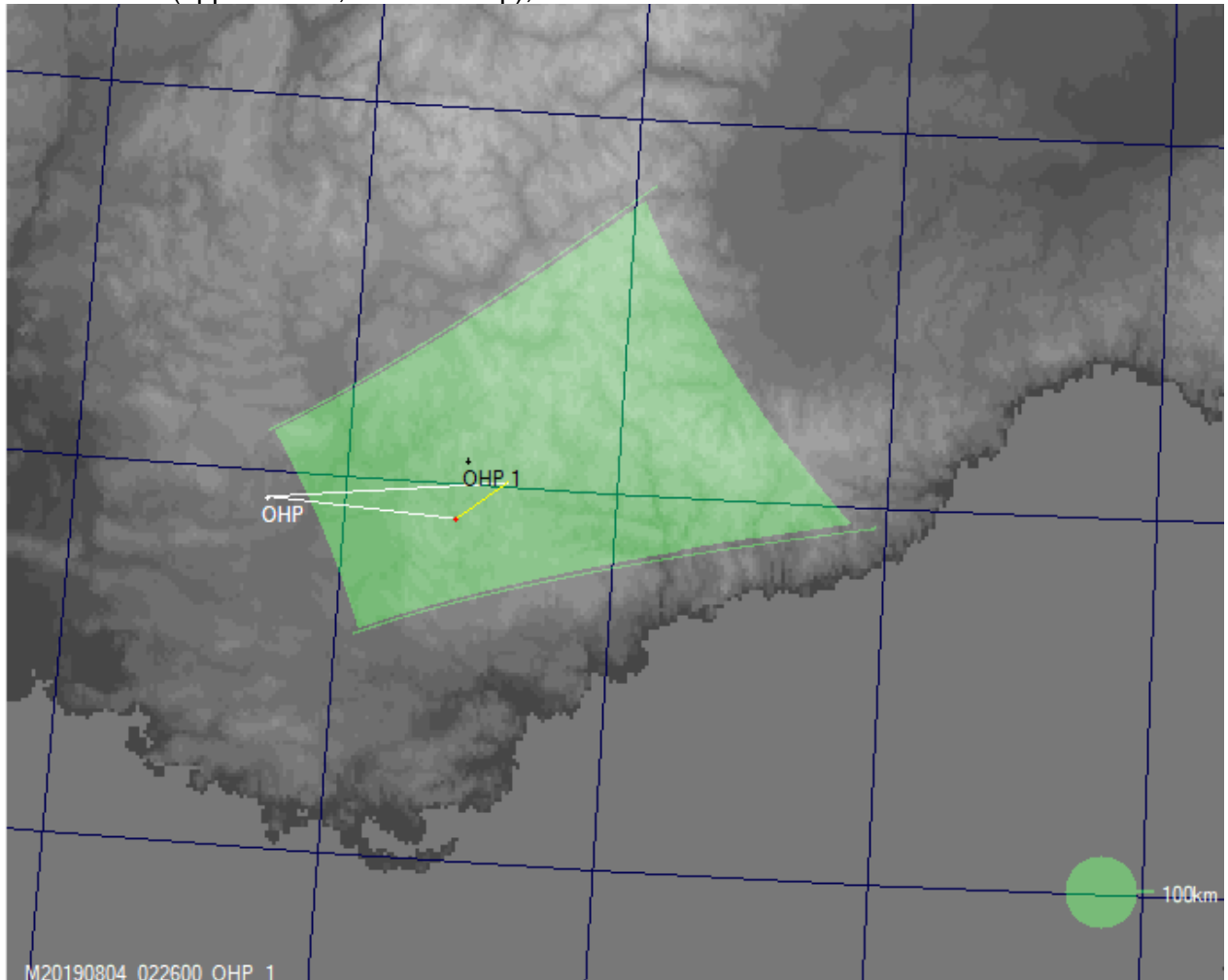


# Meteor spectra 201908, OHP

## 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:

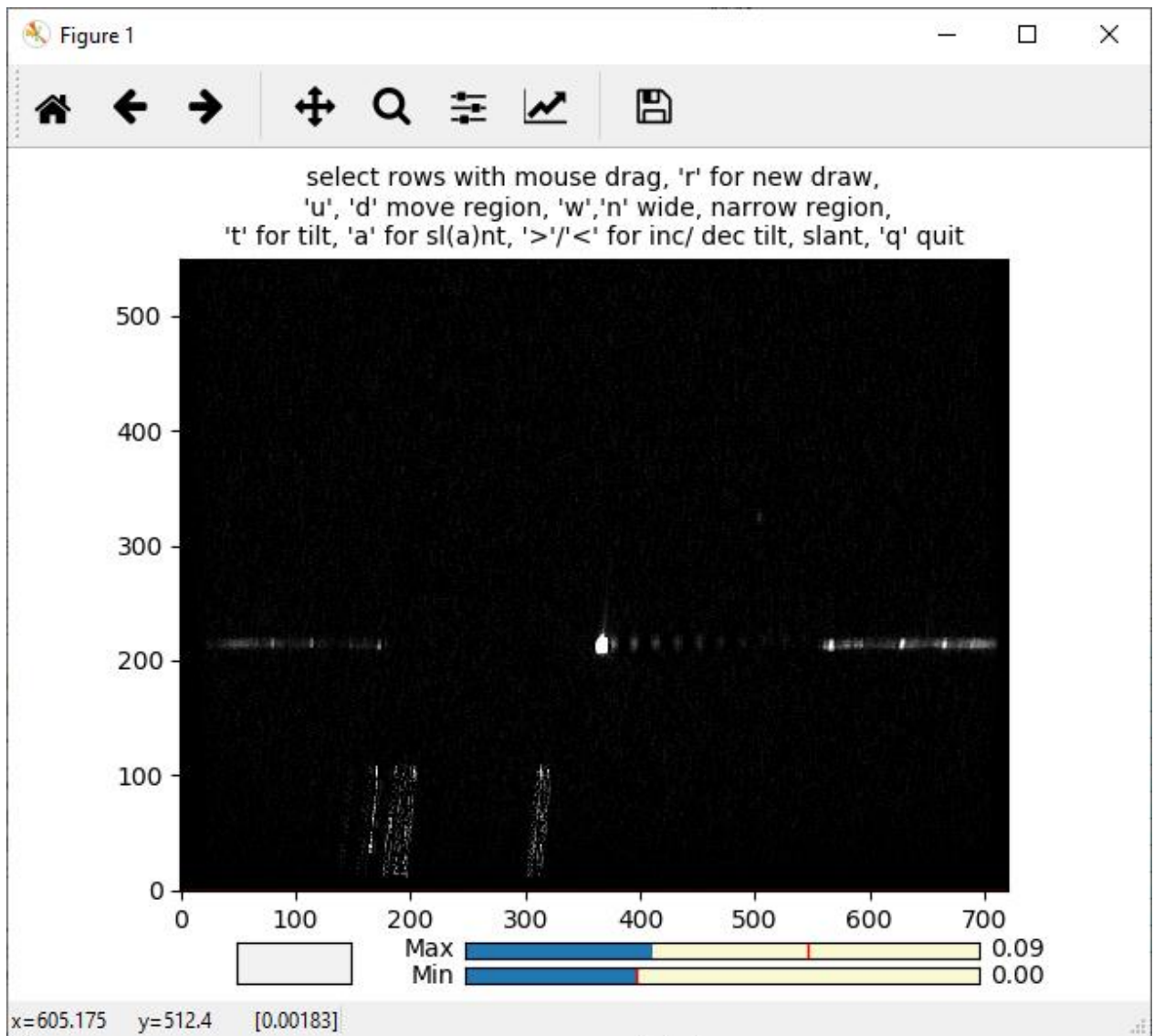


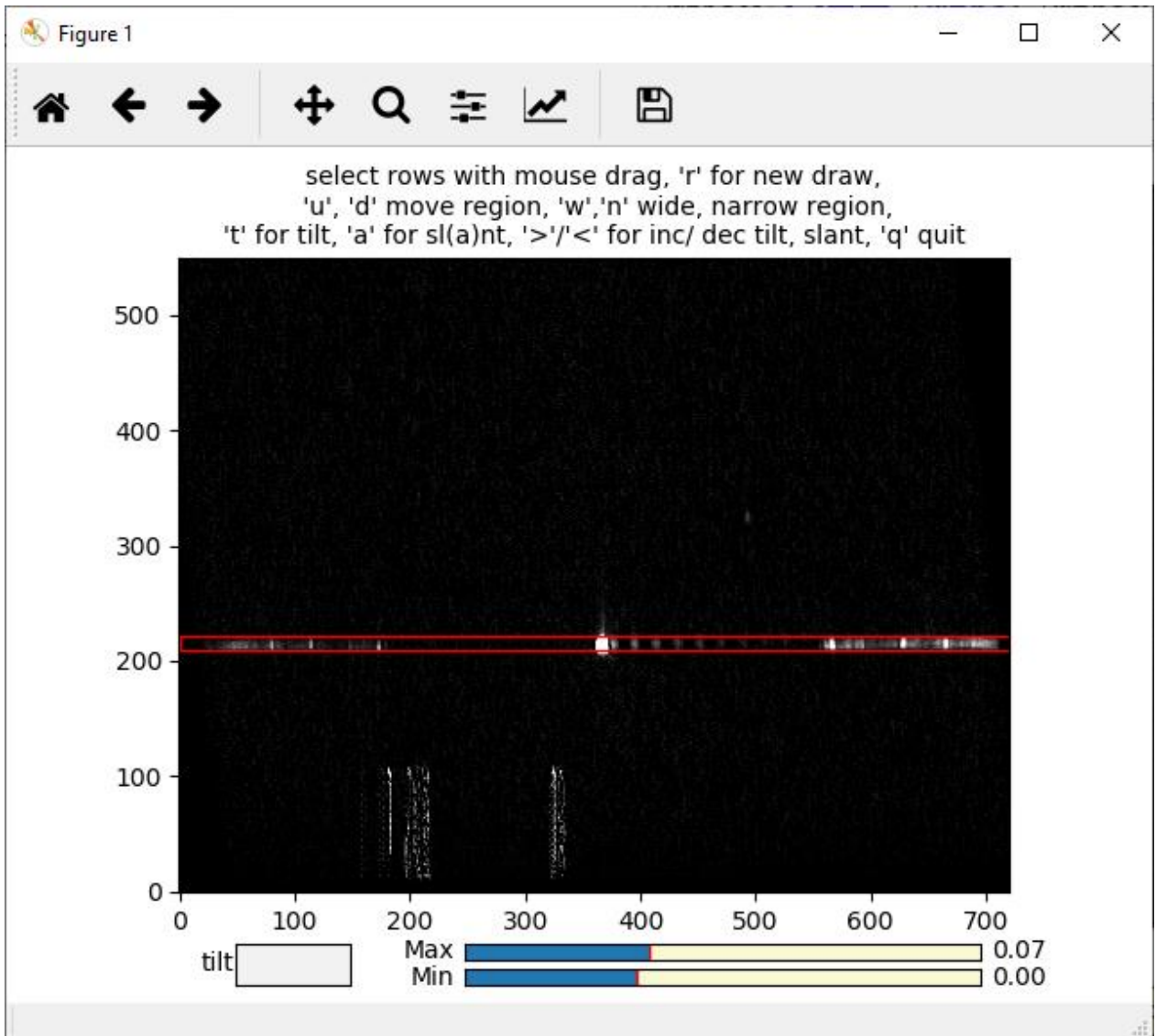
Spectrum analyzed with Python `m_pype62.py`

M20190804\_022600\_OHP\_1, PER, -3.8m

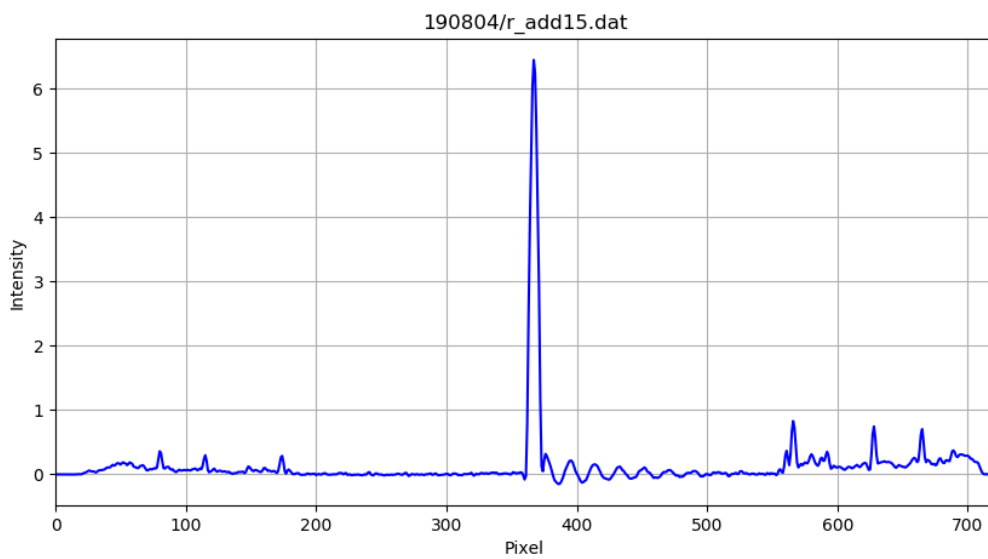


Registered images:





Tilt angle and slant corrected, rows selected



Raw spectrum, uncalibrated

Result of calibration

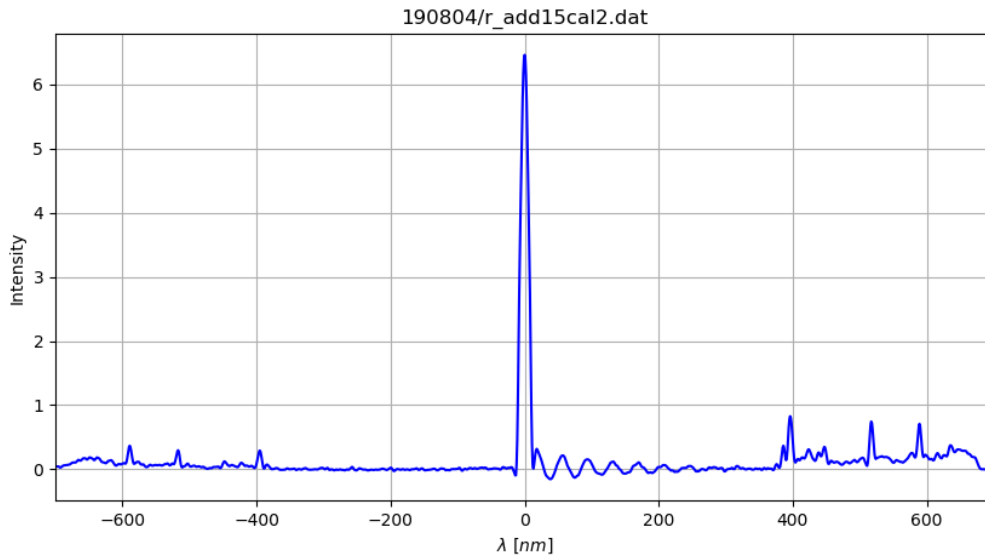
(2<sup>nd</sup> order fit, because grating was moved since last calibration, transport to OHP)

polynomial for fit lambda c: [-1.280e-04 2.111e+00 -7.580e+02]

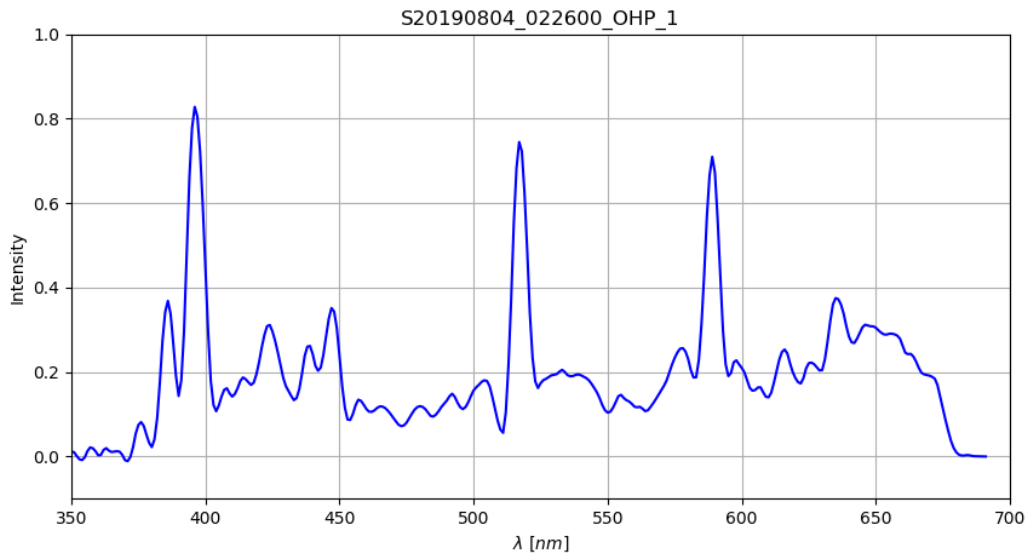
| pixel   | lambda   | fit      | error   |
|---------|----------|----------|---------|
| 80.31,  | -589.00, | -589.23, | -0.2285 |
| 114.82, | -517.50, | -517.23, | 0.2696  |
| 367.16, | 0.00,    | -0.04,   | -0.0378 |
| 627.98, | 517.50,  | 517.41,  | -0.0936 |
| 664.82, | 589.00,  | 589.09,  | 0.0904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

rms\_x = 0.1693

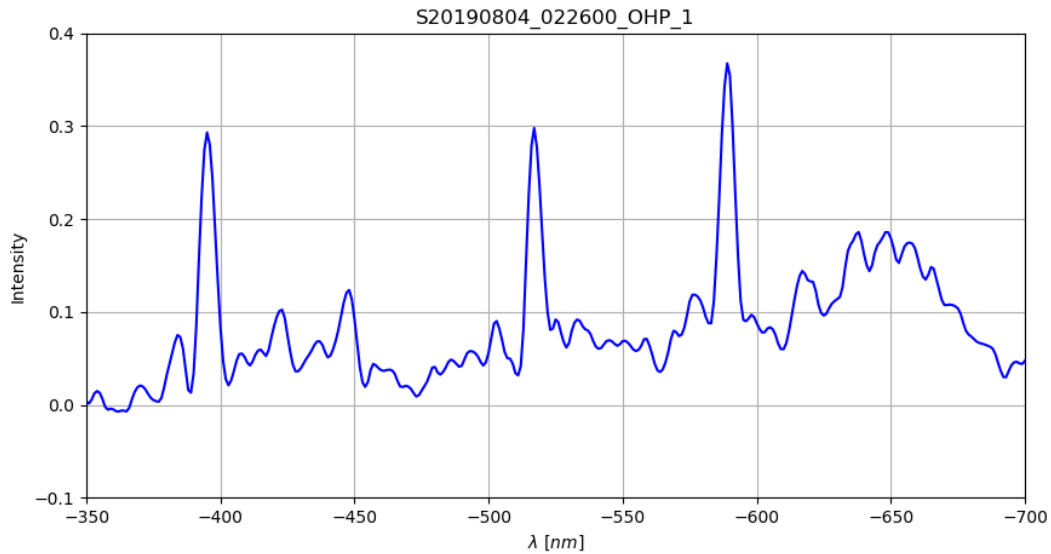
spectrum 190804/r\_add15cal.dat saved



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

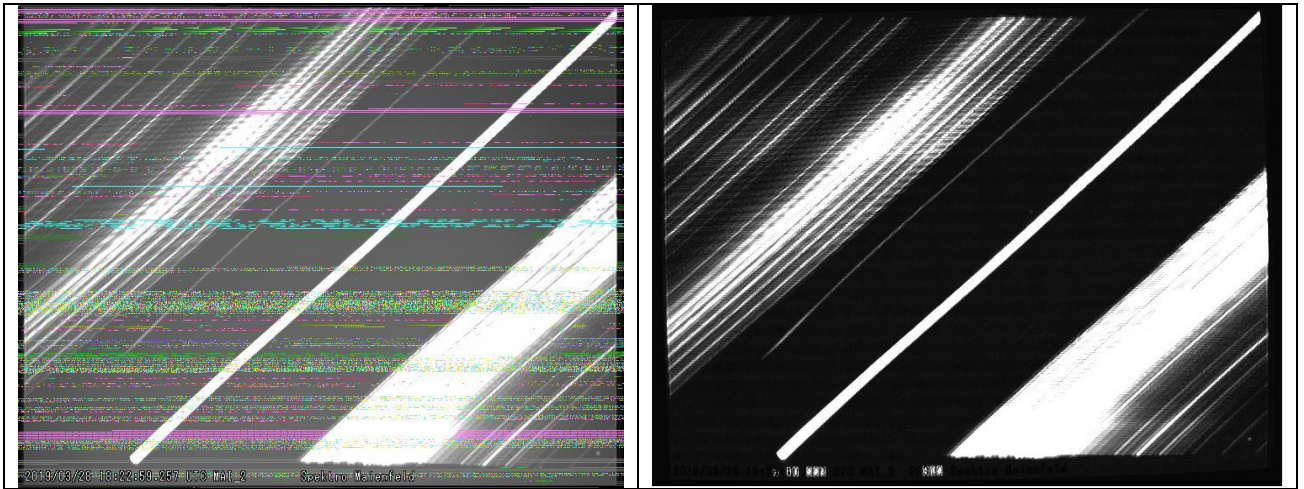
**Table 3-7:** List of spectral lines frequently found in meteor spectra and their relative intensities. The identification of the lines (numbers) in our example is also given. Lines marked with an asterisk appear in spectra of fast meteors, such as the Perseids, but much fainter in spectra of slow meteors.

| Laboratory data              |                 |           | ident.<br>number | Laboratory data              |                 |           | ident.<br>number |
|------------------------------|-----------------|-----------|------------------|------------------------------|-----------------|-----------|------------------|
| $\lambda_{\text{lab}}$ , [Å] | atom/ion        | intensity |                  | $\lambda_{\text{lab}}$ , [Å] | atom/ion        | intensity |                  |
| 3719.9                       | Fe              | 10        | 2                | 4923.9                       | Fe <sup>+</sup> | 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 <sup>+</sup> | 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 <sup>+</sup> | 40*       | 8                | 5371.5                       | Fe              | 9         |                  |
| 3968.5                       | Ca <sup>+</sup> | 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 <sup>+</sup> | 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 <sup>+</sup> | 6*        |                  |
| 4404.8                       | Fe              | 11        |                  | 6371.4                       | Si <sup>+</sup> | 3*        |                  |
| 4481.2                       | Mg <sup>+</sup> | 15*       |                  | 6495.0                       | Fe              | 1         |                  |
| 4920.5                       | Fe              | 3         |                  | 6562.9                       | H               | 2*        |                  |

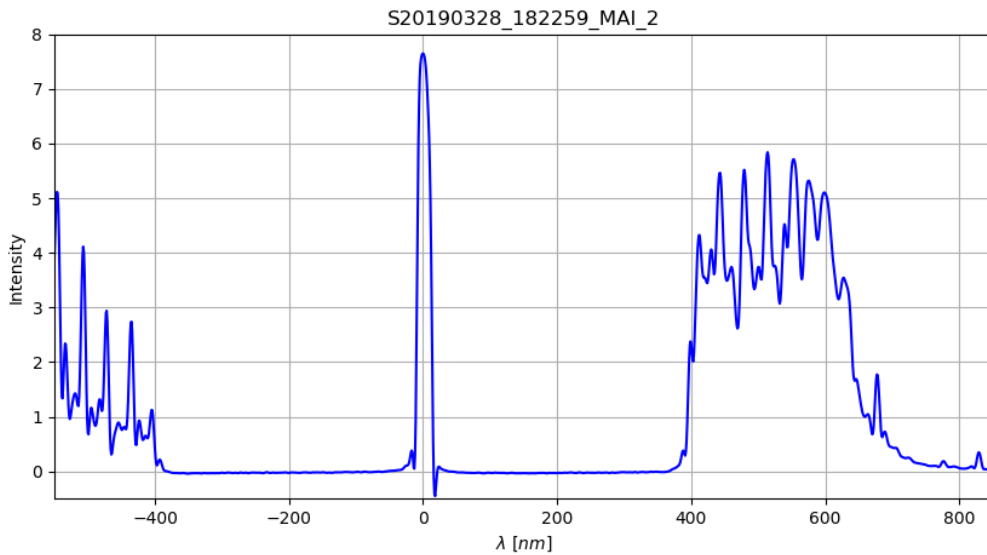
Spectral lines, (IMO Photographic Handbook 03 Spectra, p 47)

<http://www.imo.net/docs/03spectra.pdf>

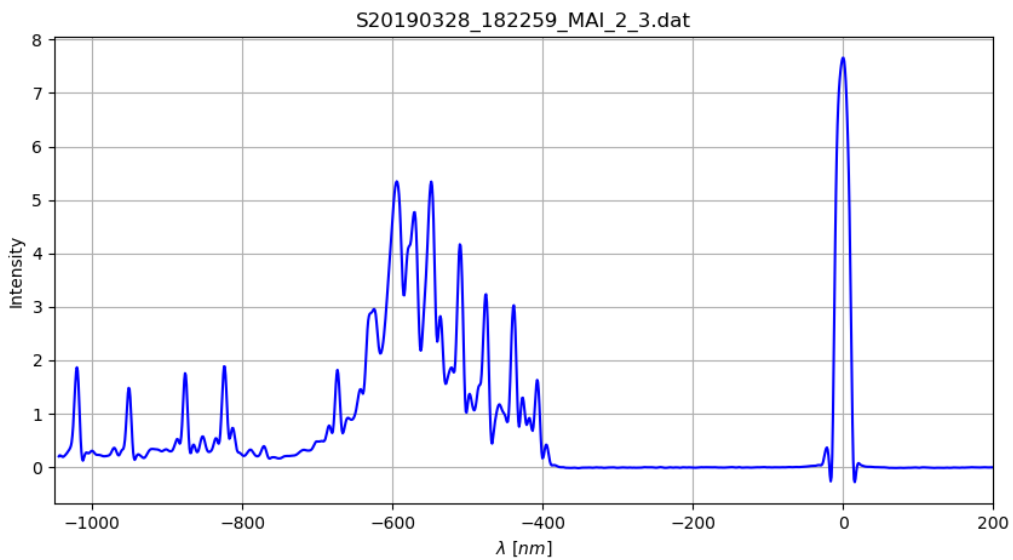
M20190328\_182259\_MAI\_2, airplane, -5.4m



First frame with large noise  
r2\_add100:



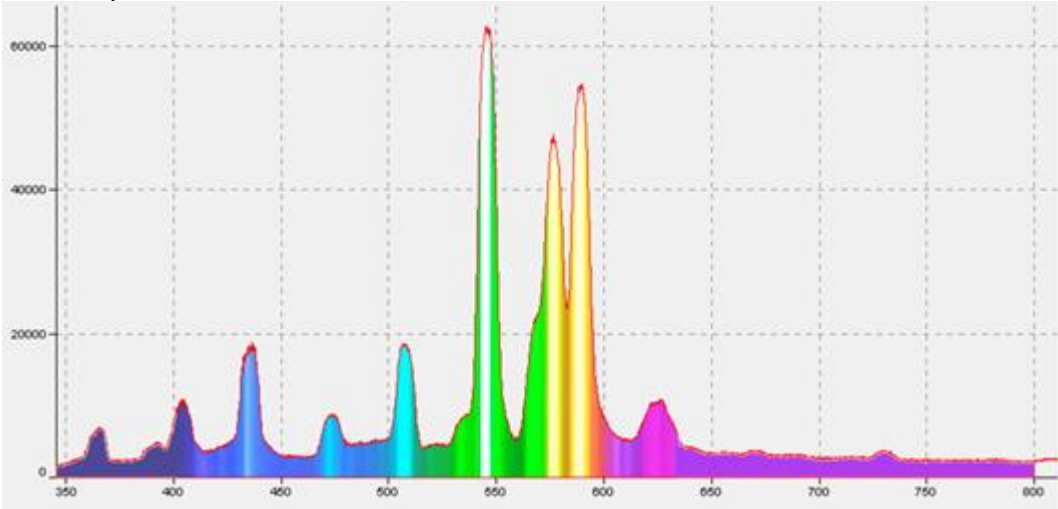
r3\_add60:





For details see [..\..\Python\190328\m\\_pipe190329.log](..\..\Python\190328\m_pipe190329.log)

For comparison:



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