Calibration of a liquid crystal etalon multispectral imager – Challenges and solutions

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CEDAR 2015

With-
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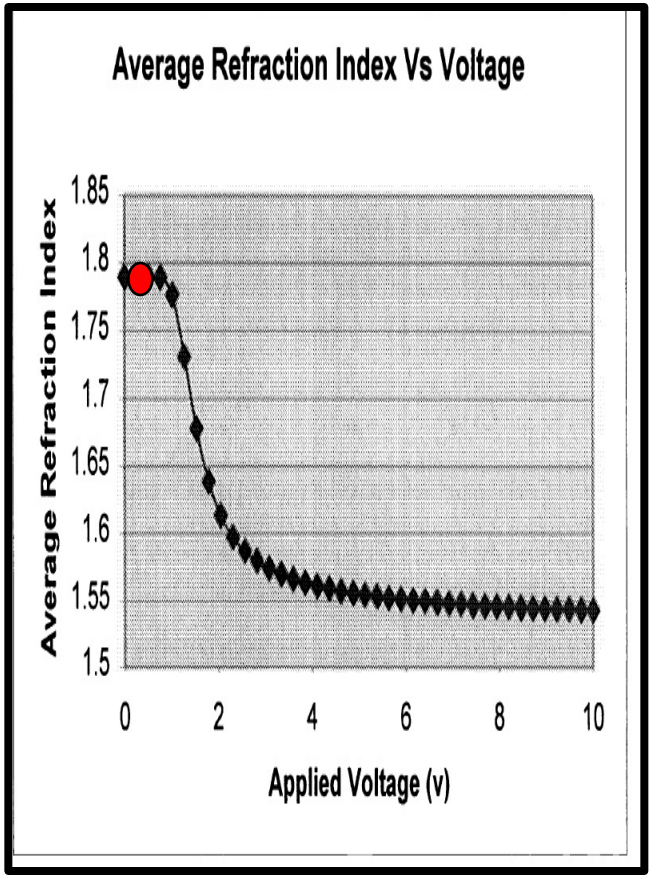
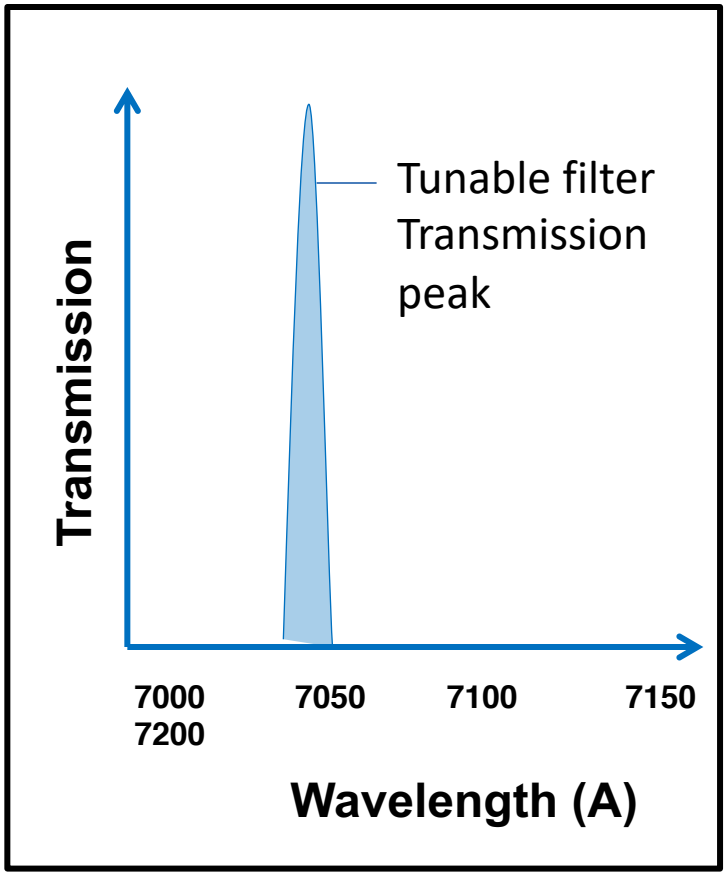
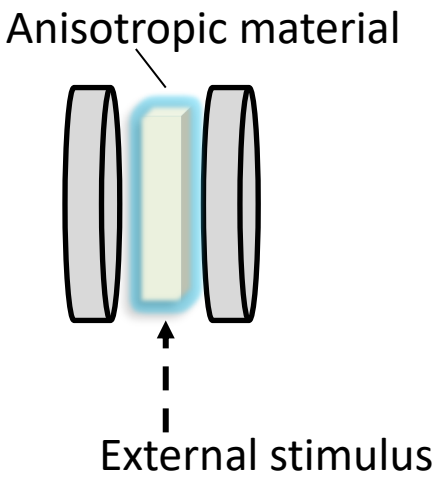
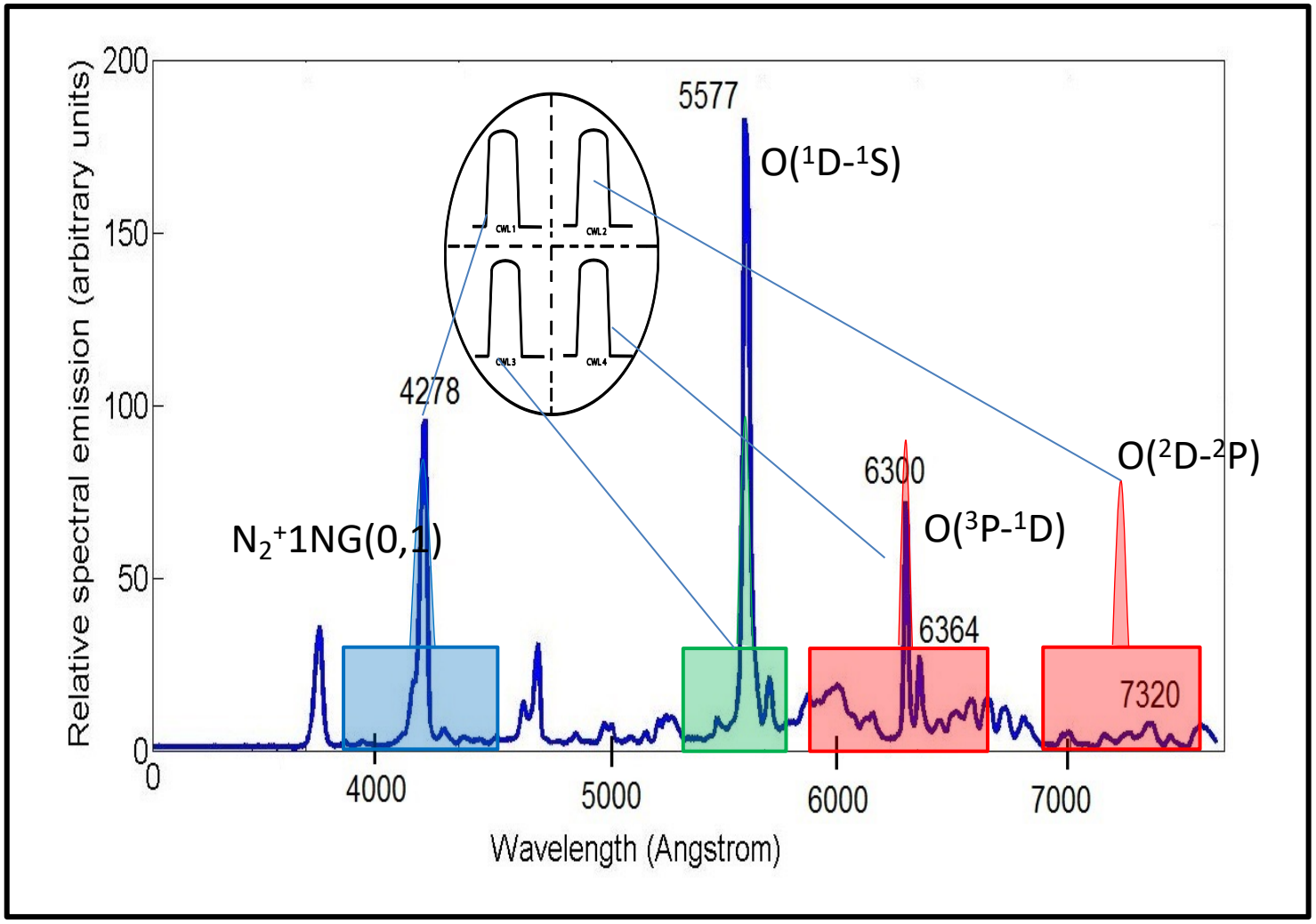
What is a tunable filter?



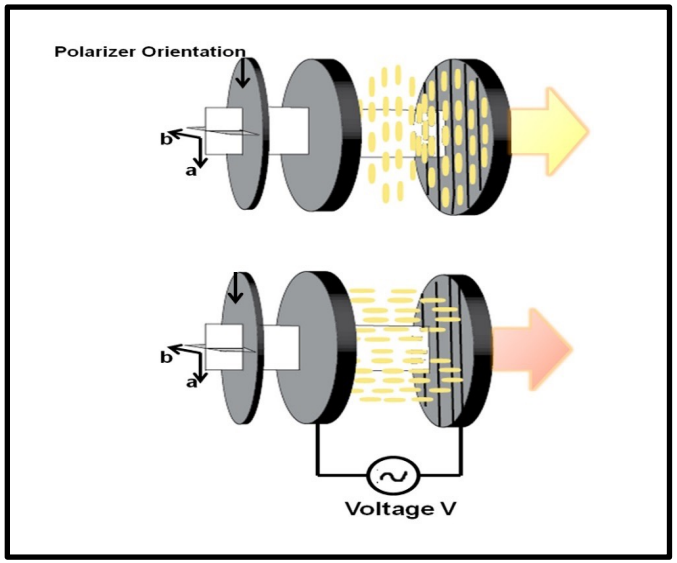


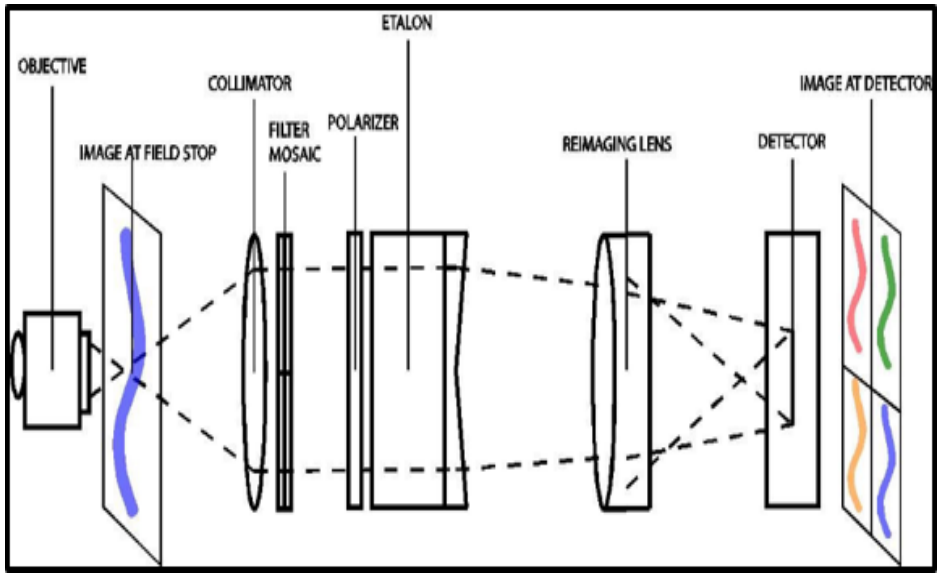


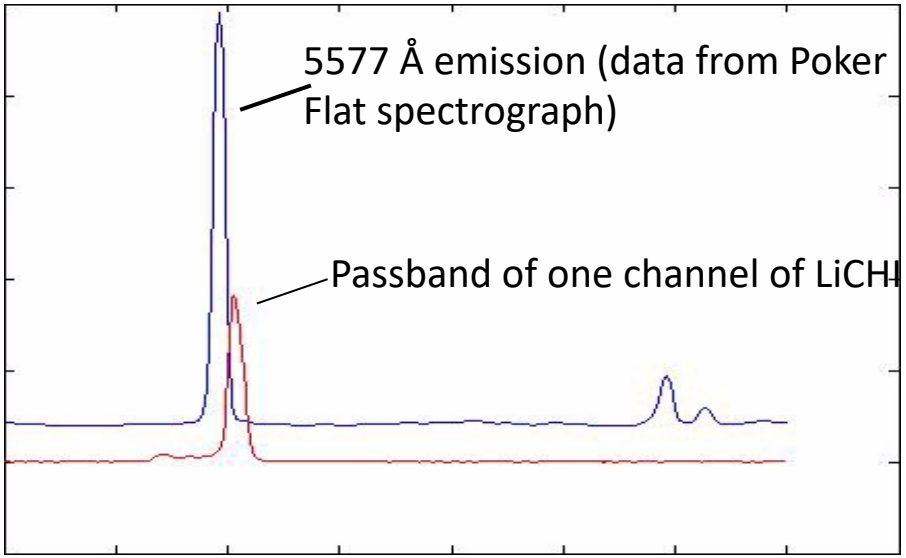
Simultaneous Multispectral Imaging of Aurora



LiCHI – based on Liquid Crystal Fabry-Perot etalon

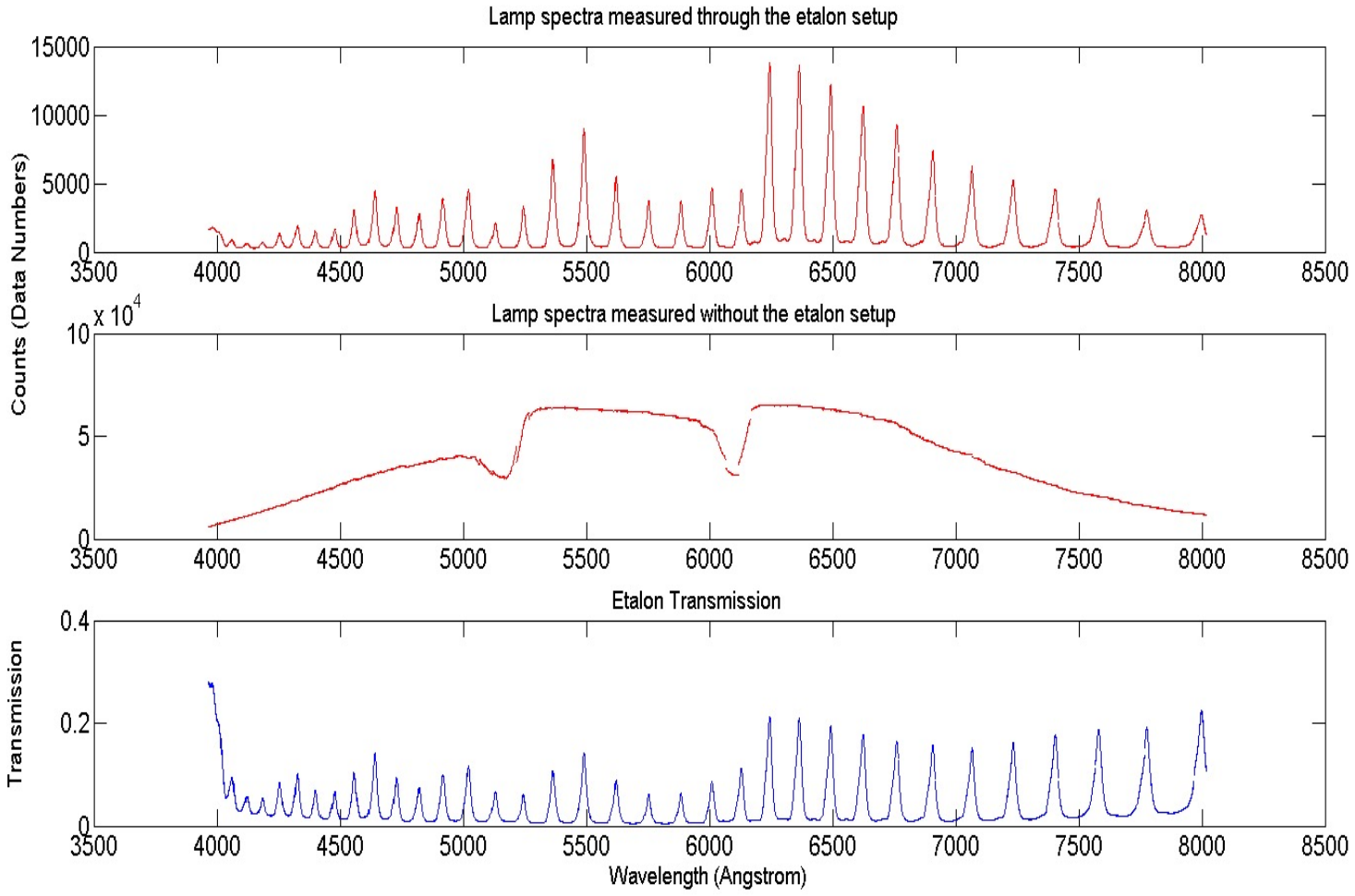






[Goenka et al 2013]

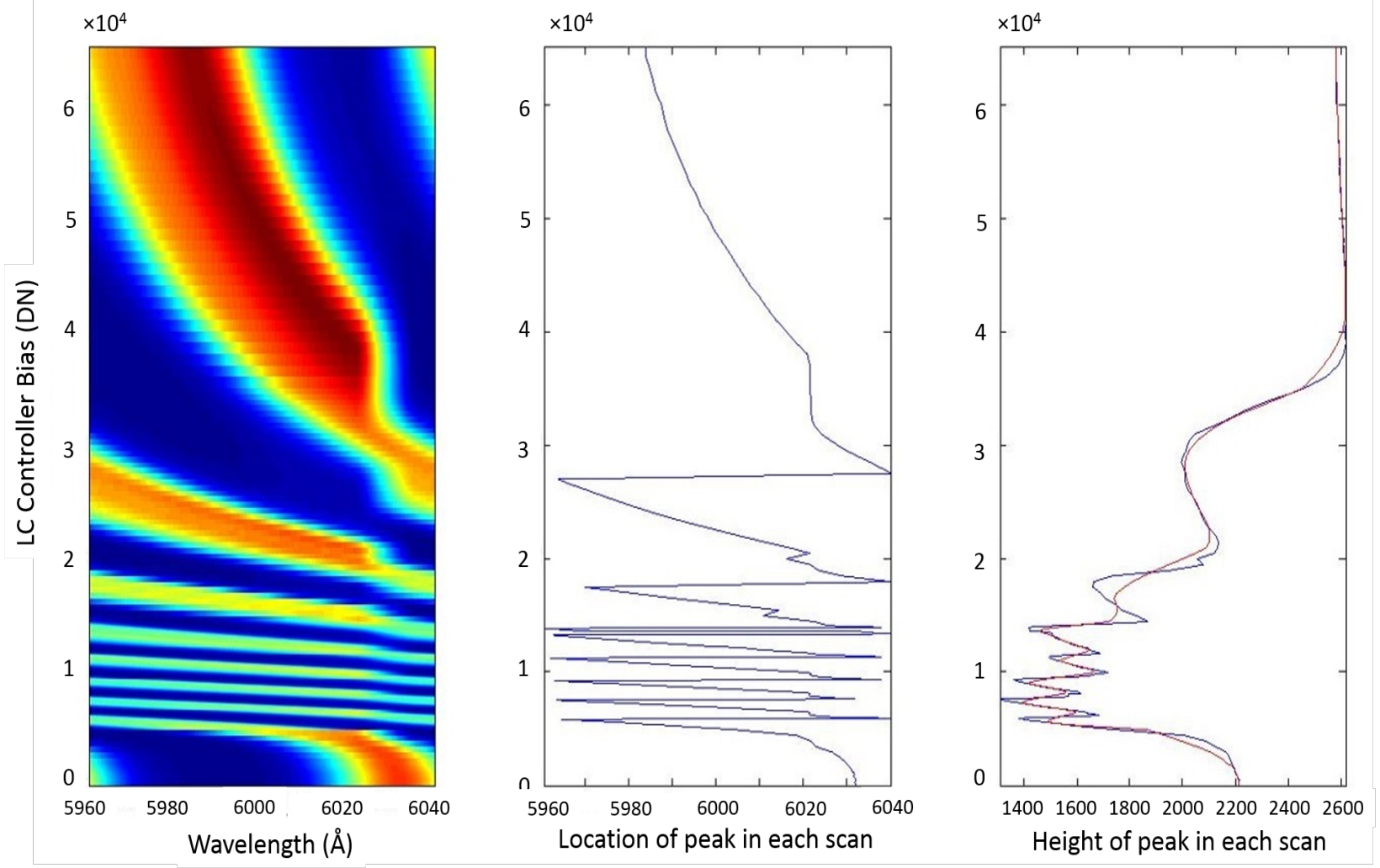
Wavelength calibration of the LCFP etalon



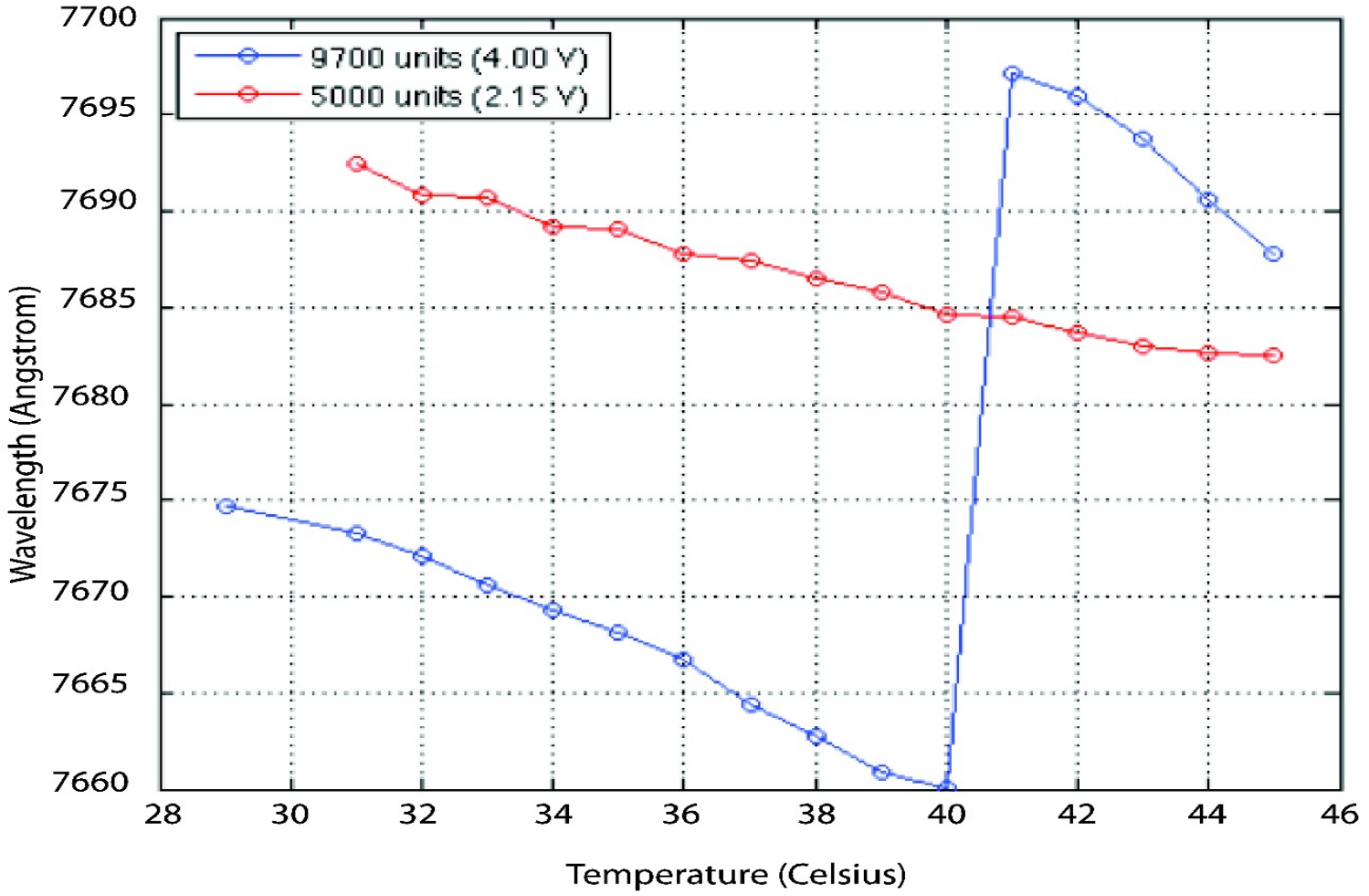
Wavelength Calibration

[Goenka et al., accepted, 2015]

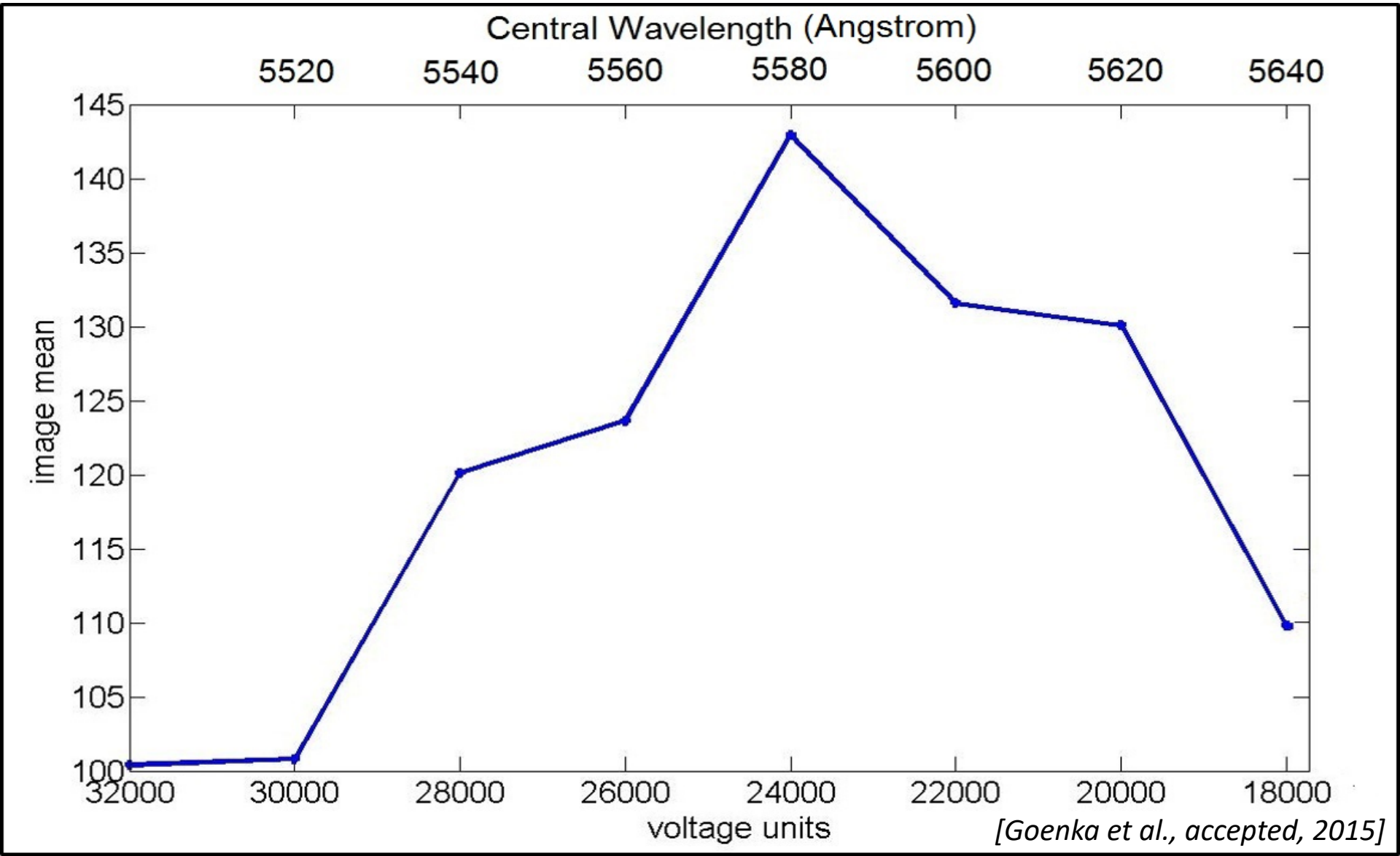
Voltage calibration of the LCFP etalon



Effect of temperature on LCFP etalon

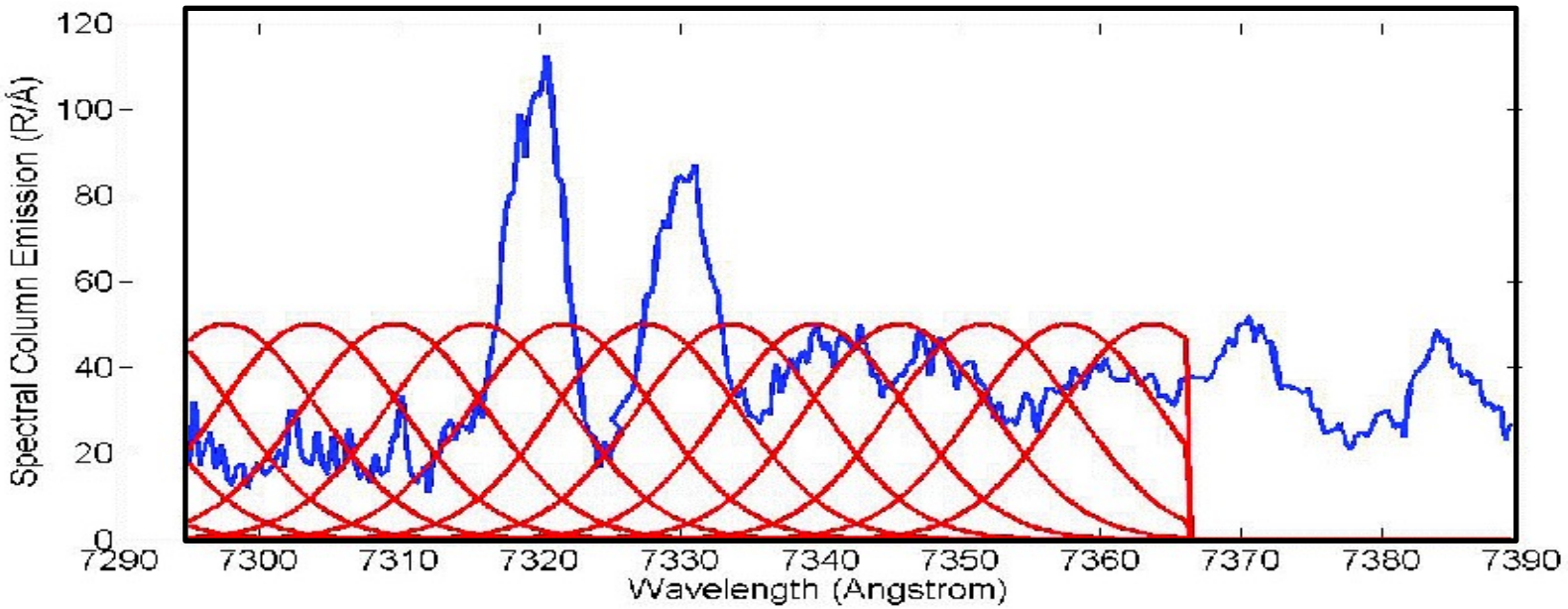


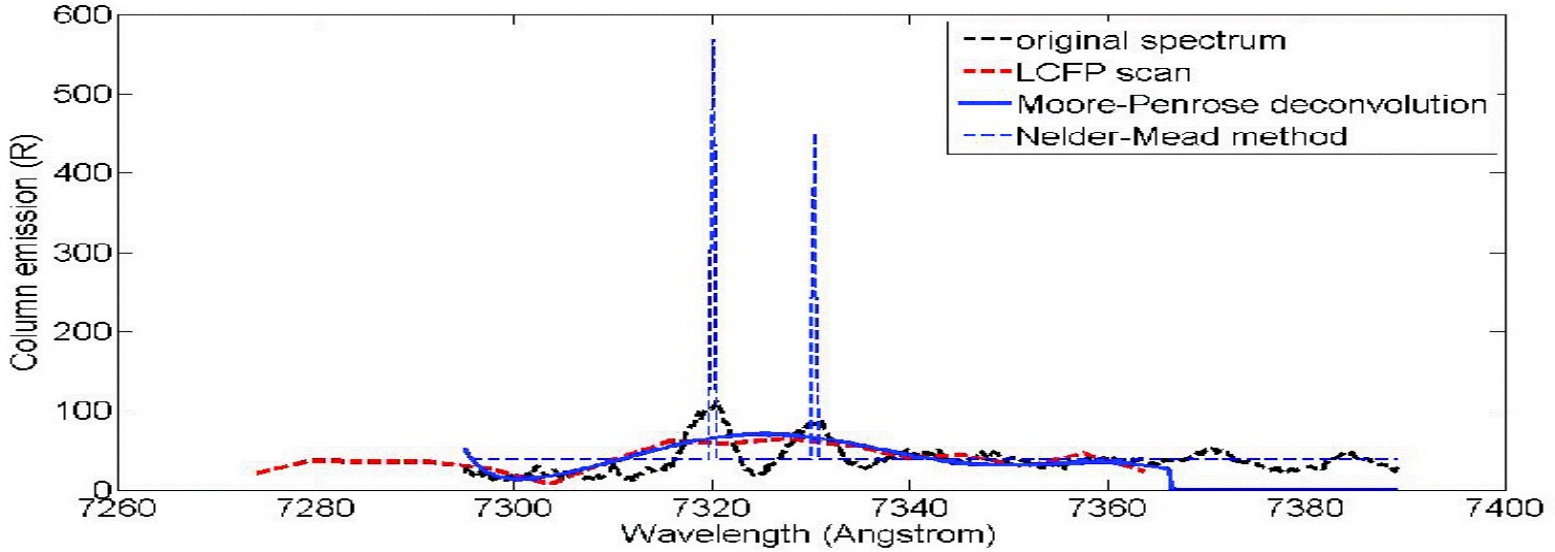
Challenges while operating in the field



[Goenka et al., accepted, 2015]

Challenges for data analysis





[Goenka et al 2013]

Challenges to solve in the future

- Cannot focus all channels equally perfectly with one front optical tube– a balance needs to be found
  - Solution : use four optical tubes in the front to be able to focus the channels individually and still one detector

- Lower throughput than standard techniques
  - Light collection methods can be used to collect light discarded by polarizers
  - EMCCD cameras can be used with high gain

Thank you!