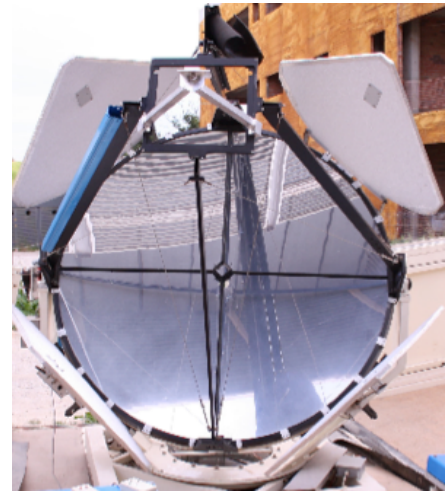


Status of the IFAE/UAB Raman LIDAR

Markus Gaug

Universitat Autònoma de Barcelona

markus.gaug@uab.cat



- + Oscar Abril (IFAE)
- + Oscar Blanch (IFAE)
- + Oriol Calpe (UAB)
- + Michele Doro (INFN Padova)
- + Lluís Font (UAB)
- + Daniel Guberman (IFAE)
- + Manel Martínez (IFAE)

Situation in 2015

- ⌘ Funding for LIDAR has been insufficient this year (as most Spanish funding proposals in 2015)
- ⌘ Workshop at IFAE has become heavily involved in bogies for LST, LIDAR has dropped to low priority

Achievements in 2015 (practically w/o funds...)

- **Hardware:**

- ⌘ Polychromator has started production and assembling (but workshop not yet fully dedicated).
- ⌘ Installed new dichroic guiding mirrors,
- ⌘ Received permission to operate LIDAR (from 1-3 am)
- ⌘ Aligned the LIDAR in zenith position (fine-alignment still ongoing)
- ⌘ Unfortunately, laser needs some additional maintenance

- **Software:**

- ⌘ Library to read Licel files ready
- ⌘ Internal communication translated from Labview to C (in process)

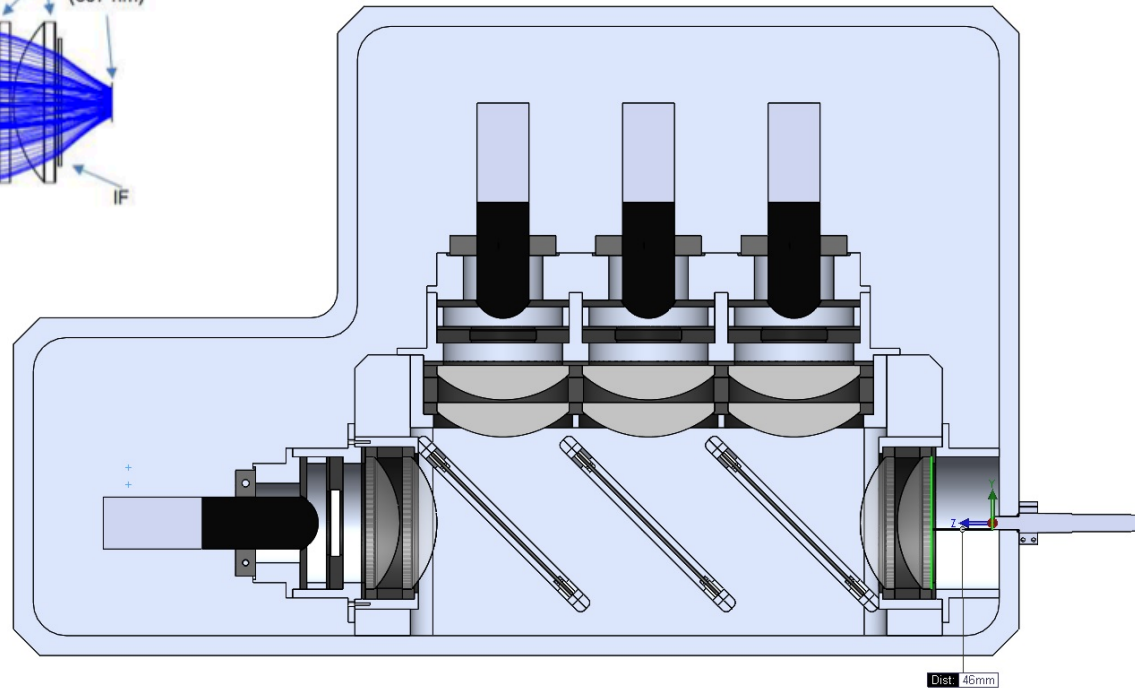
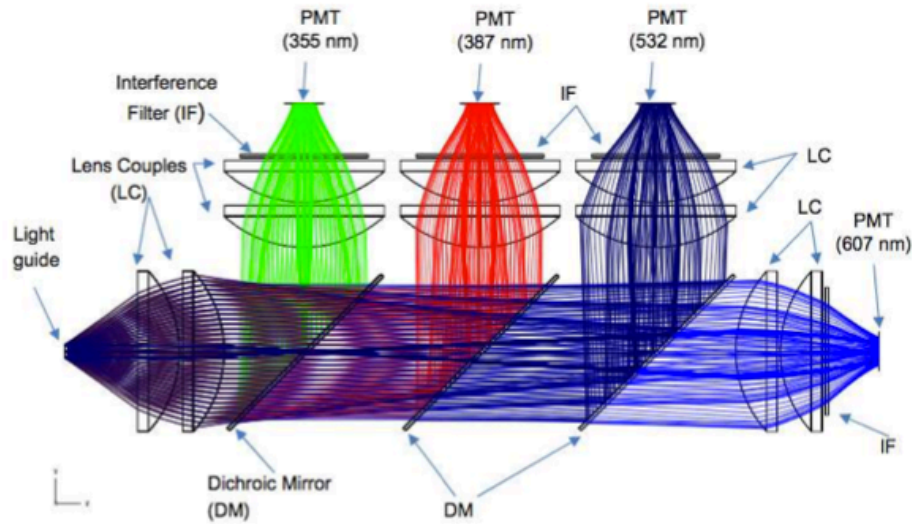
- **Documentation:**

- ⌘ Finished one bachelor thesis on pre-alignment (Eudald Font)
- ⌘ Another bachelor thesis on alignment and near-range solutions is on-going (Oriol Calpe)
- ⌘ Constantly update a LIDAR TDR
- ⌘ ICDs created (except for the one with ACTL)

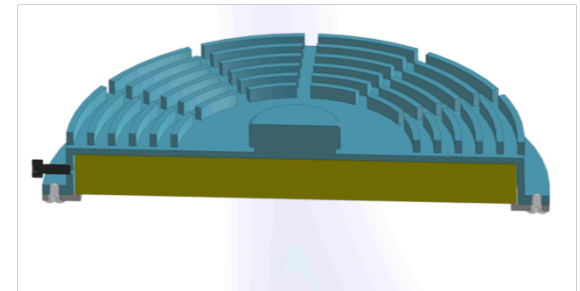
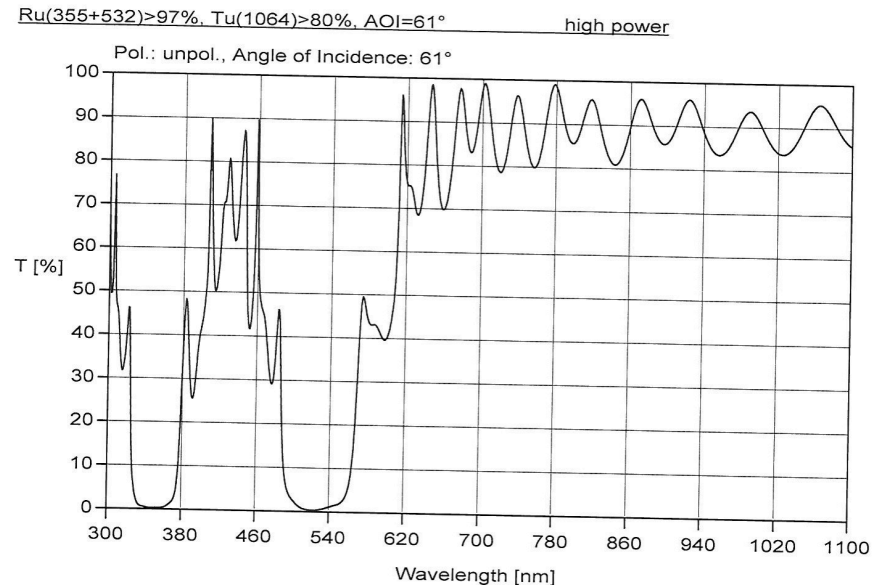
- **New ideas:**

- ⌘ Near-range solution

Polychromator

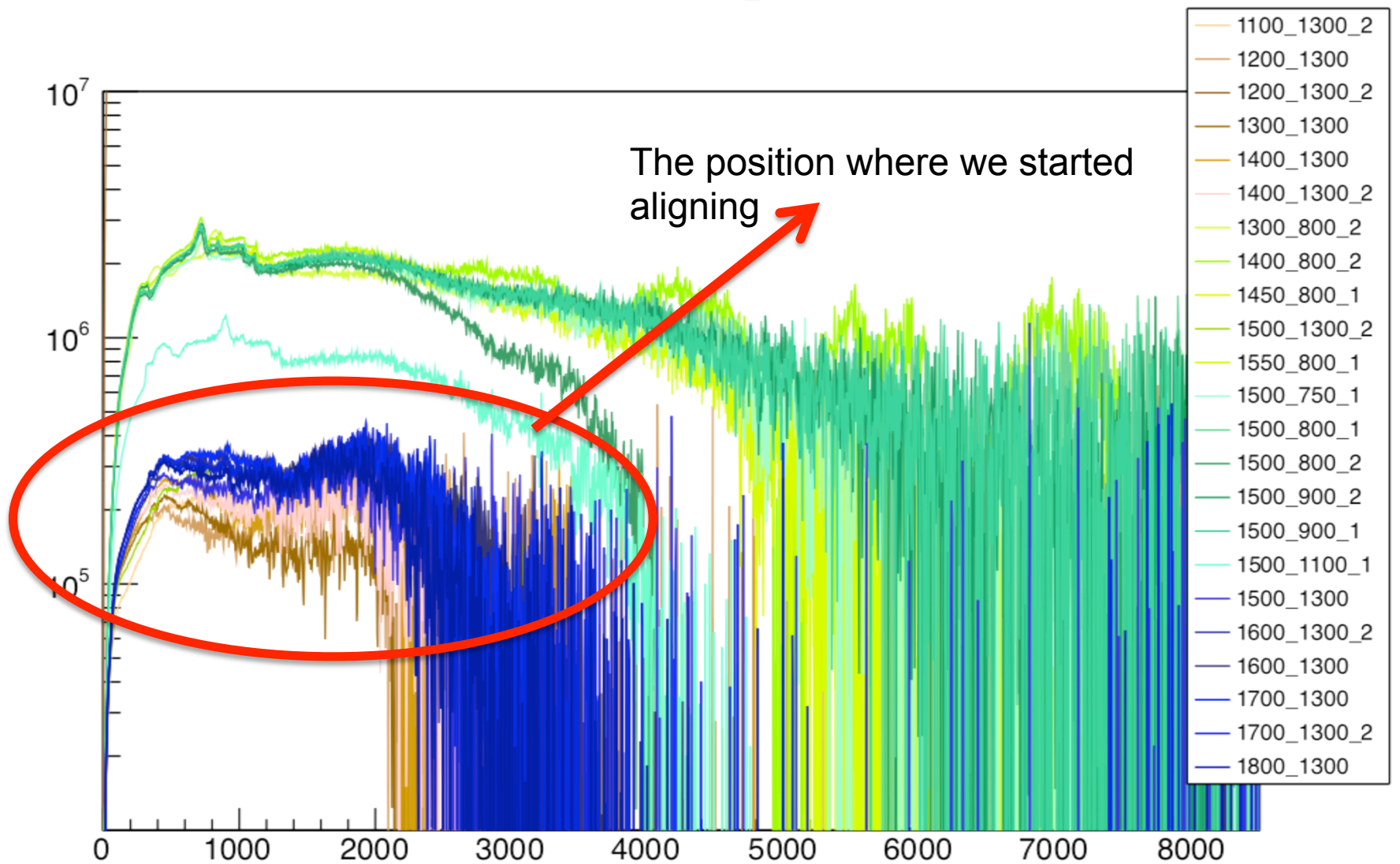


New dichroic guiding mirrors

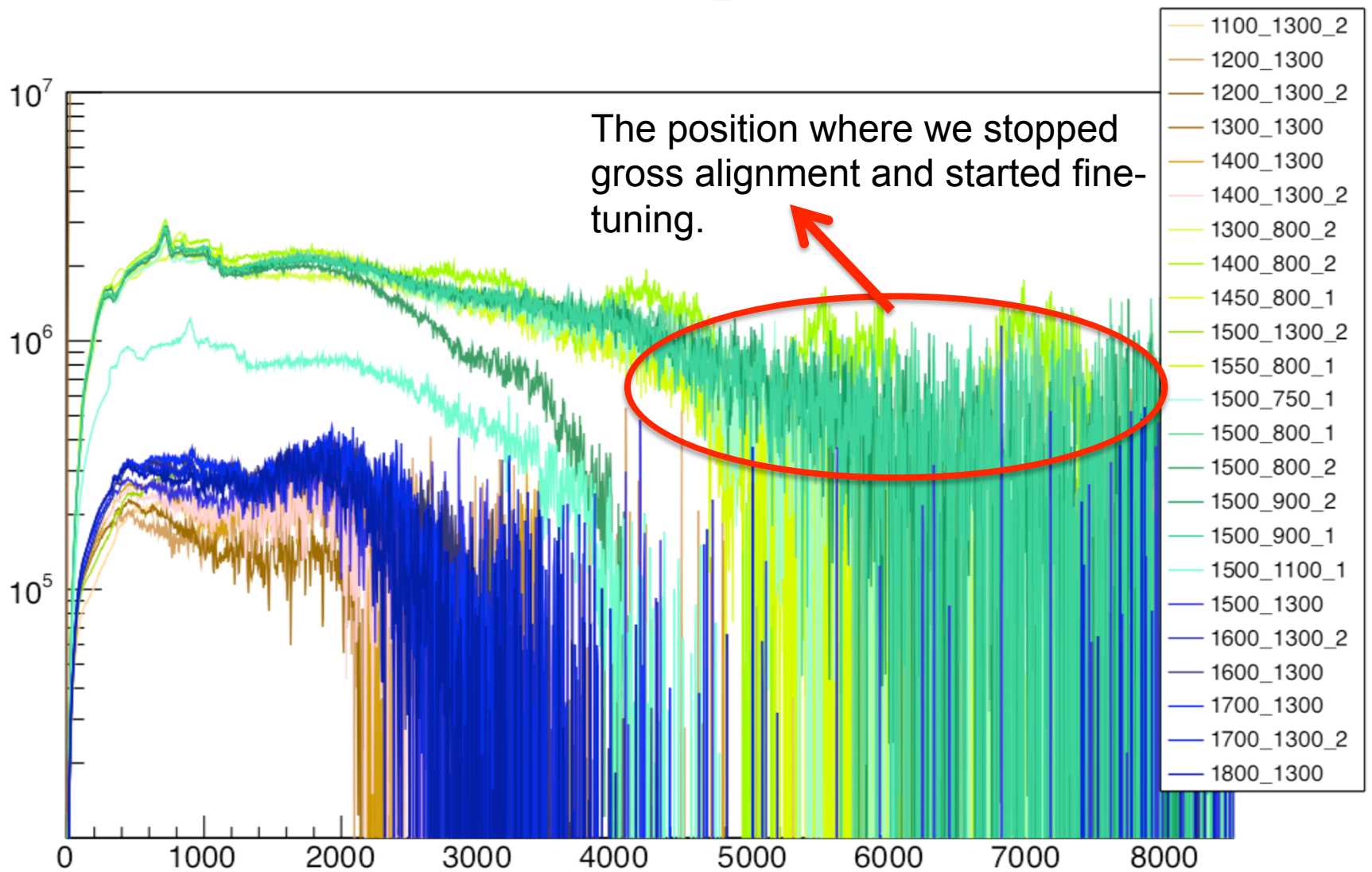


Tailored by “OptoPrim”, Italy.
Reflect >97% at 355 and 532 nm, but <10% at 1064
(at correct incidence angle of 61 deg,)

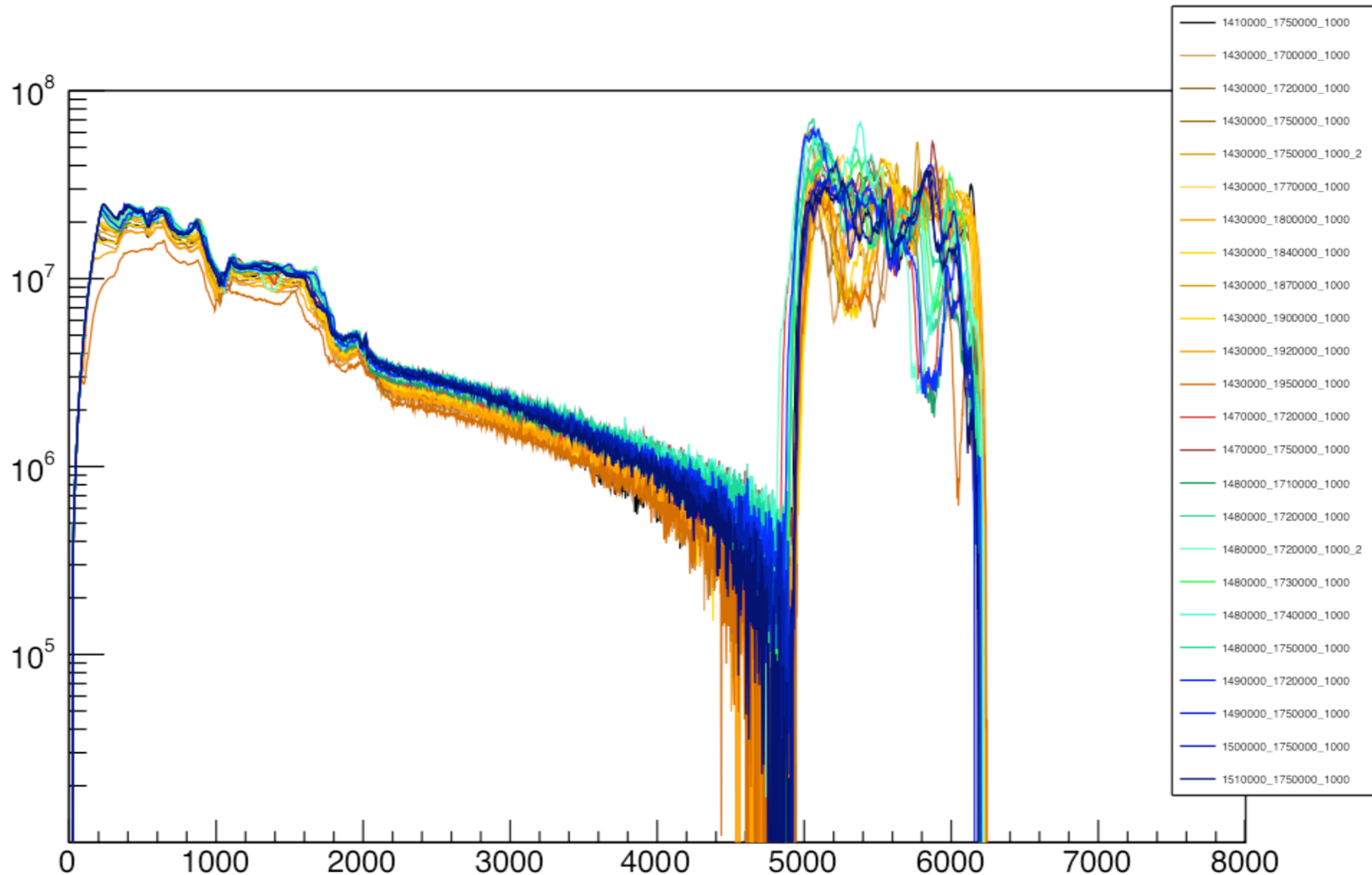
LIDAR alignment



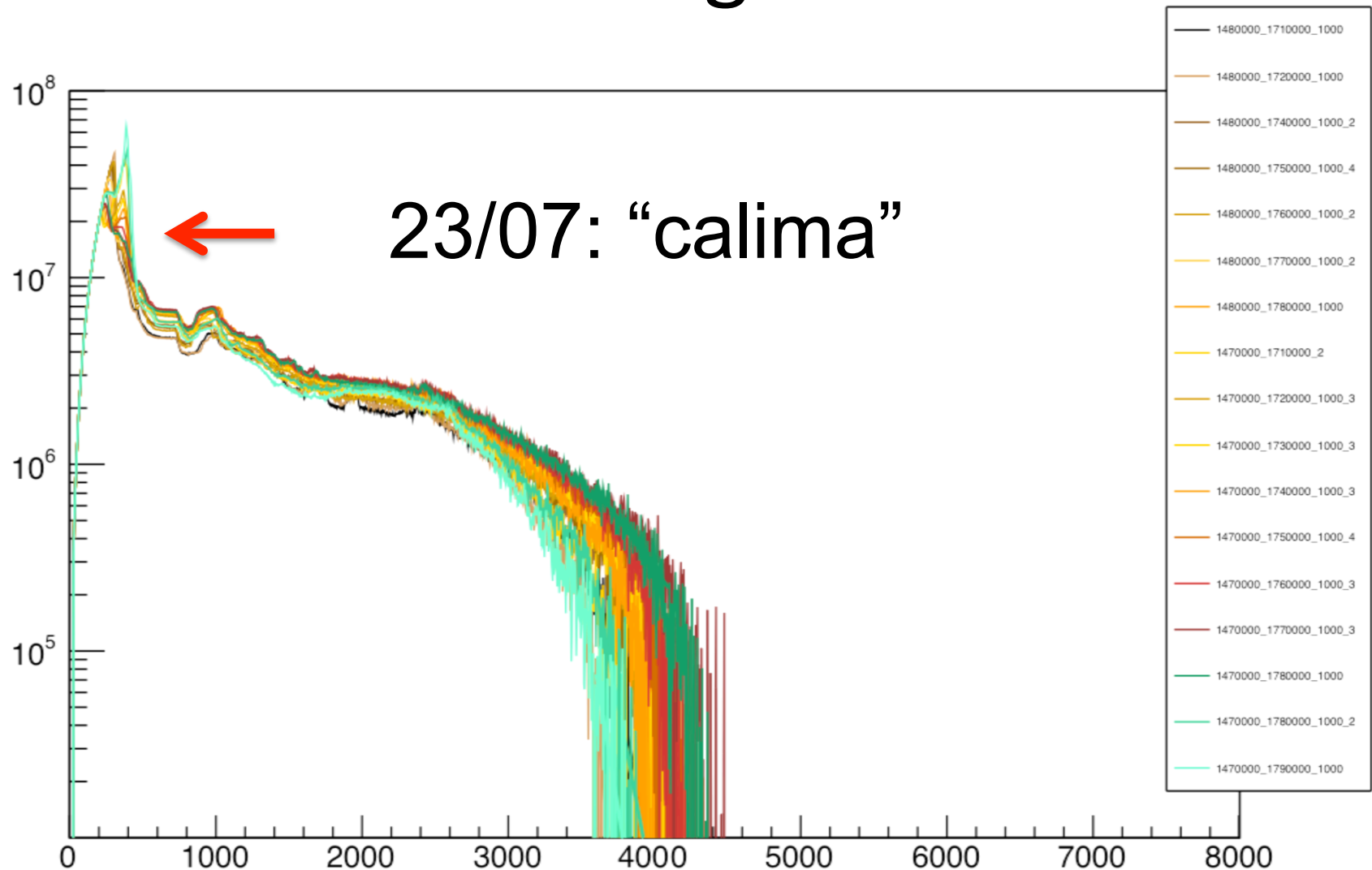
LIDAR alignment



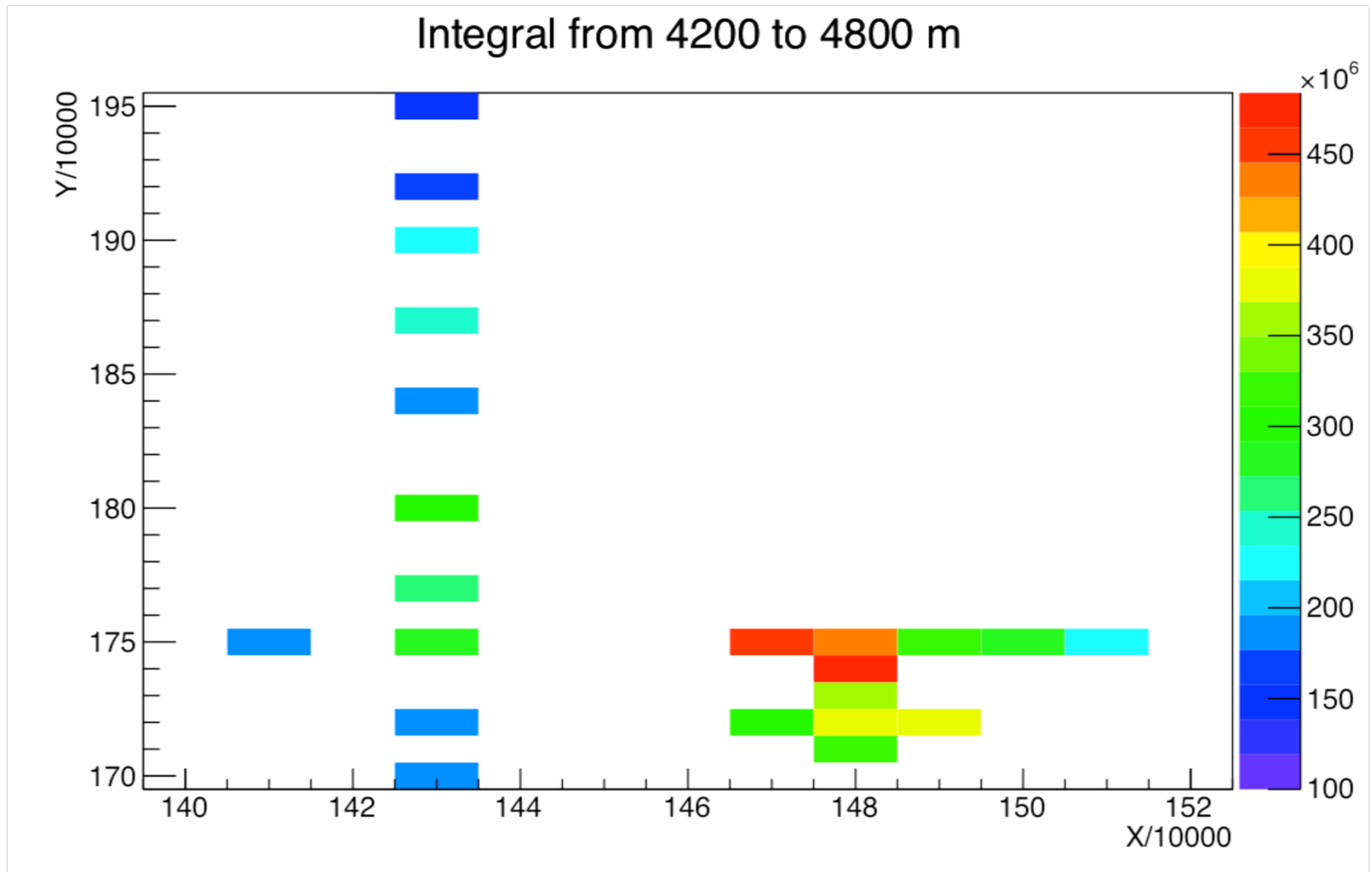
LIDAR alignment



LIDAR alignment

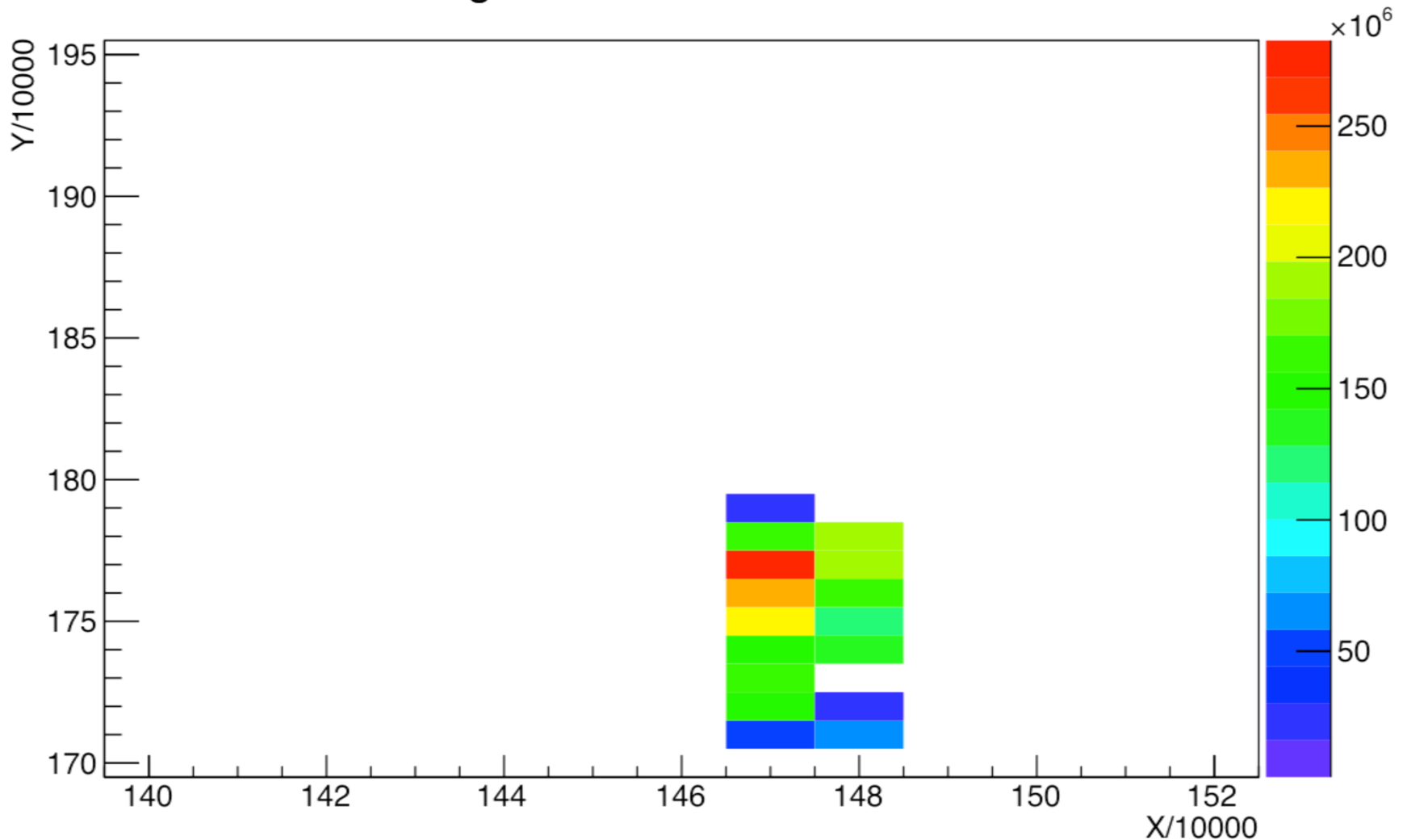


LIDAR Alignment prel. results



LIDAR Alignment prel. results

Integral from 4200 to 4800 m



Documentation

UNIVERSITAT AUTÒNOMA DE BARCELONA

TREBALL DE GRAU DE FÍSICA

Alineament de l'UAB-IFAE Raman LIDAR

Autor:
Eudald FONT

Director:
Dr. Markus GAUG
Tutor:
Dr. Lluís FONT



Alineament de l'UAB-IFAE Raman LIDAR i solucions pel abast proper

Autor:
Oriol Calpe Blanch

Director:
Dr. Markus Gaug
Tutor:
Prof. Lluís Font Guiteras

Technical Design of a Raman LIDAR for Atmospheric Calibration for the Cherenkov Telescope Array

O. Abril, O. Blanch, J. Boix, V. Da Deppo, M. Doro, E. Font Pladevall,
L. Font Guiteras, M. Gaug, A. López-Oramas, M. Martínez

April 29, 2015

Abstract

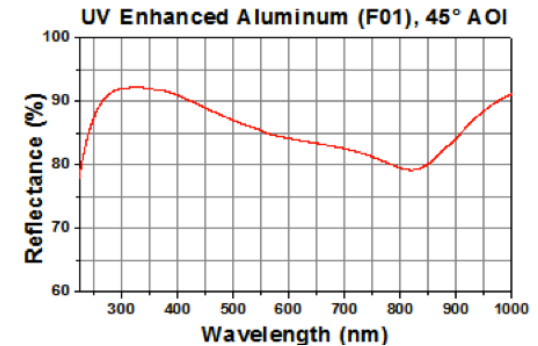
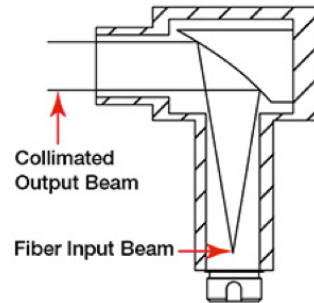
This document outlines the technical design of the UAB/IFAE Raman Lidar for the atmospheric calibration of CTA.

Reference	I-INFRA-NORTH-COM-3000
1	INFRA-NORTH
2	COM
Document Title	IFAE/LUPM/UAB Raman LIDAR location within array
Location	
1.1.1 Description of the item	
The LIDAR must hold a minimum distance of 100 m from any LST, and a minimum distance of 50 m from any MST. It should be close to a power and data line.	
Device dimensions closed: 1 TEU container: 20 ft x 8 ft x 8 ft (6 m x 2.4 m x 2.4 m)	
Device dimensions opened: 6 m x 7.2 m x 2.4 m	
Device mass: max. 25 t (will be specified later on)	
Overall foundation dimensions: 7m x 7.2 m	
Grounding: INFRA needs to provide an earthing electrode	
Cable (ducts) through the foundations: both data and power ducts (separated) need to arrive in the middle of the side part (the one which is 7m long)	
Allowed maximum foundation tilting: max. 0.5 degree	

Near-range solution(s)

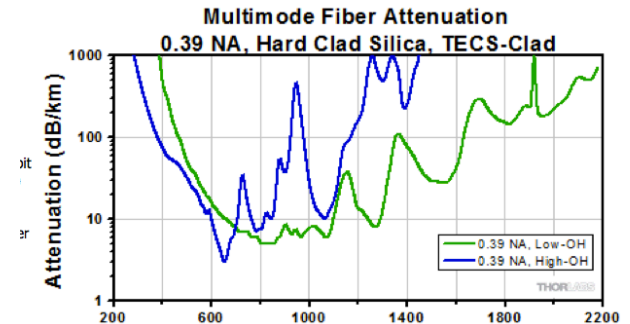
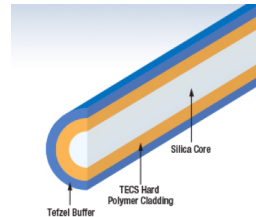
- **FC/PC-Connectorized UV-Enhanced Aluminum Reflective Collimators (RC12SMA-F01 by Thorlabs)**

- Collimator reflector
- 250 – 450 nm
- 12 mm dia. beam
- Connector SMA



- **0.39 NA TECS-Clad Multimode Optical Fiber**

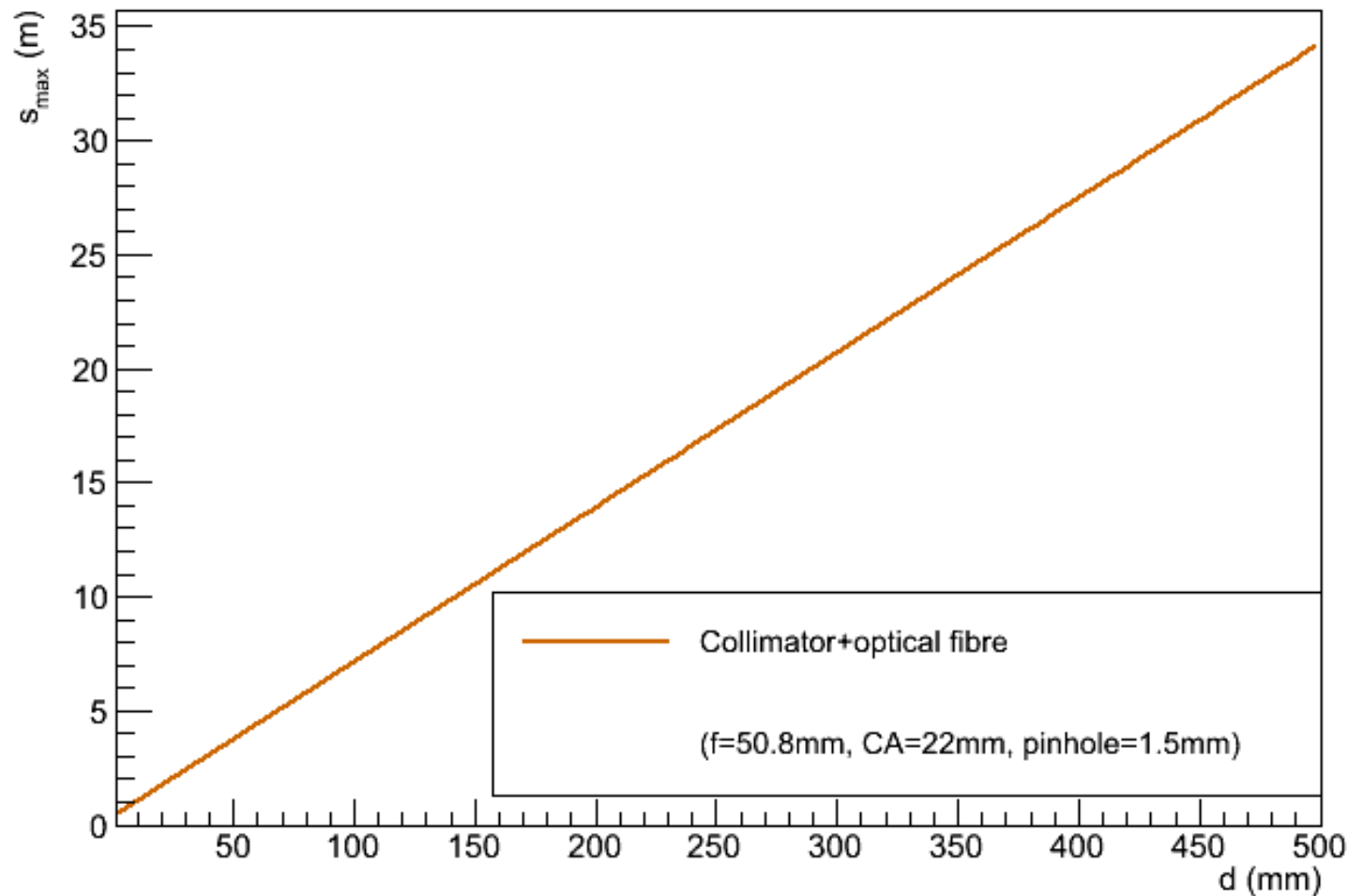
- 1,5 mm diàmetre (!!)
- SMA Connectors SMA entrance and exit
- Negligible attenuation at 355 and 532 nm



- **Total cost up to here: 1400 eur.**
- **Additional (simple) 2-line polychromator unit**

Near range solution(s)

$s_{\max}$ following Biavati et al.



Outlook

- Have applied for new funds from 2016-2018
- Once polychromator is assembled, LIDAR can start long-term tests (e.g. in La Palma)
- After long-term test and evaluation, move to unified design with LUPM for final LIDAR for CTA-N.
- Final LIDAR planned to be ready in 2019.