STATUS WSO-UV SPAIN

- OCTOBER 2017-

Ana I Gómez de Castro

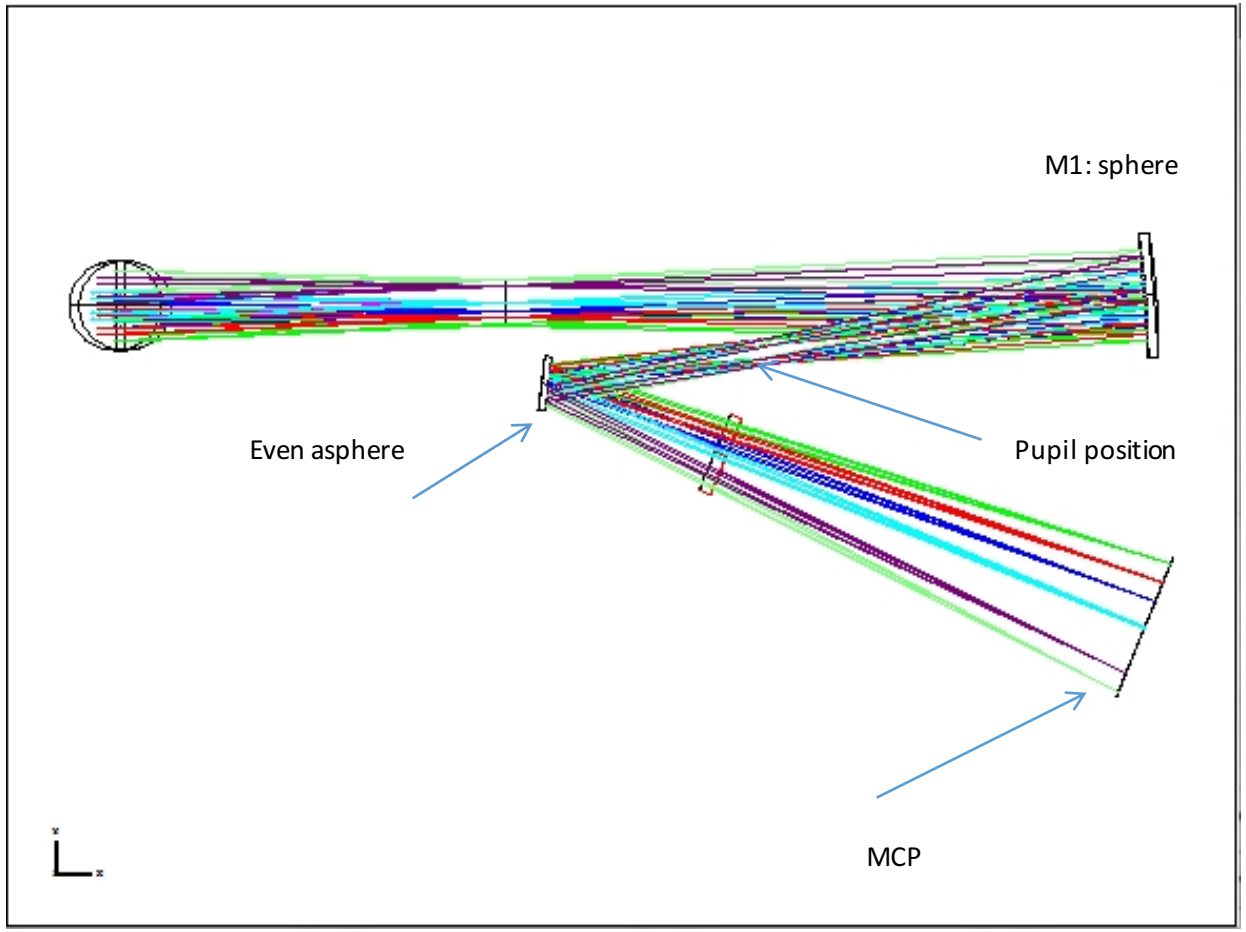
JCUVA / AEGORA Group – 26th October 2017

- INSTRUMENTATION – PARTICIPATION IN THE FCU CONSORTIUM
- SCIENTIFIC OPERATIONS – DEVELOPMENT OF SOFTWARE TO SUPPORT THE INTERNATIONAL CORE-PROGRAM CALL
- CORE PROGRAM - CONSORTIA FOR THE “PREPARATORY OBSERVATIONS CAMPAIGNS”

PARTICIPATION IN FCU DESIGN AND DEVELOPMENT

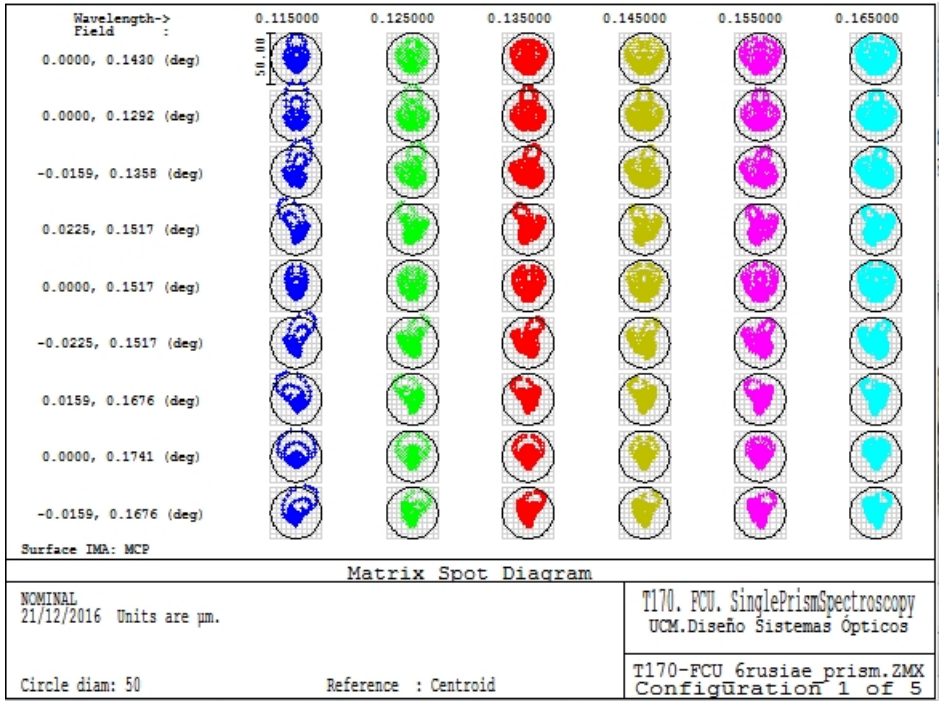
- FCU FUV CHANNEL DESIGN
- DETECTOR CONTRACT (KICK OFF DECEMBER 2017)

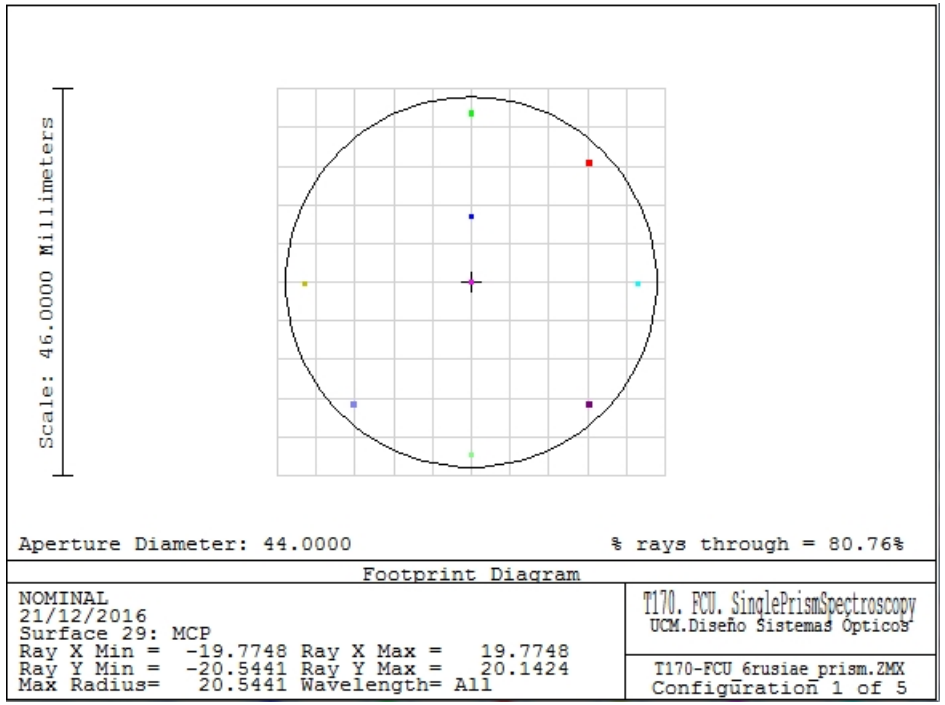
FCU DESIGN: FUV CHANNEL



M1 tilt slightly increased to free pupil space.

SPOT DIAGRAM (CIRCLES ARE 3 PIXELS DIAMETER)





Imaging Mode.
Pixel size=15 microns
FOV 2.7' diameter

Plate scale=0.061"/pix

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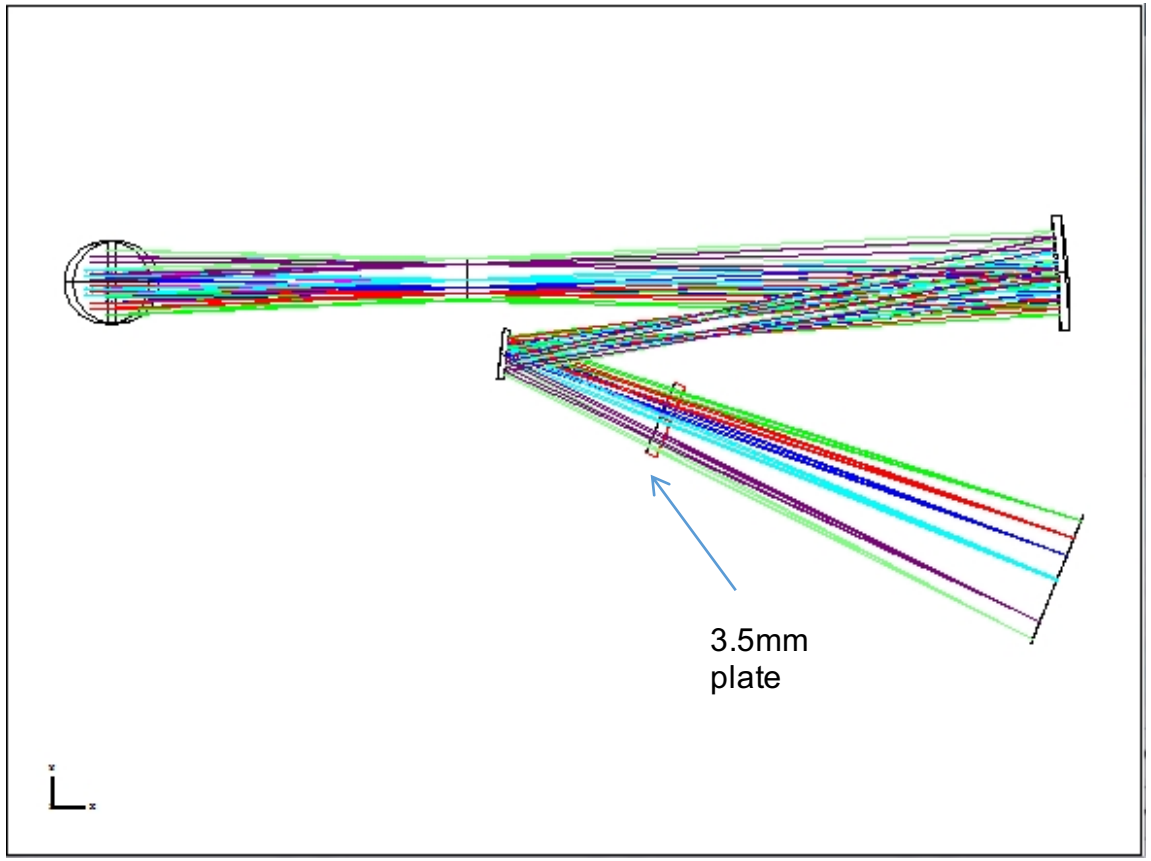
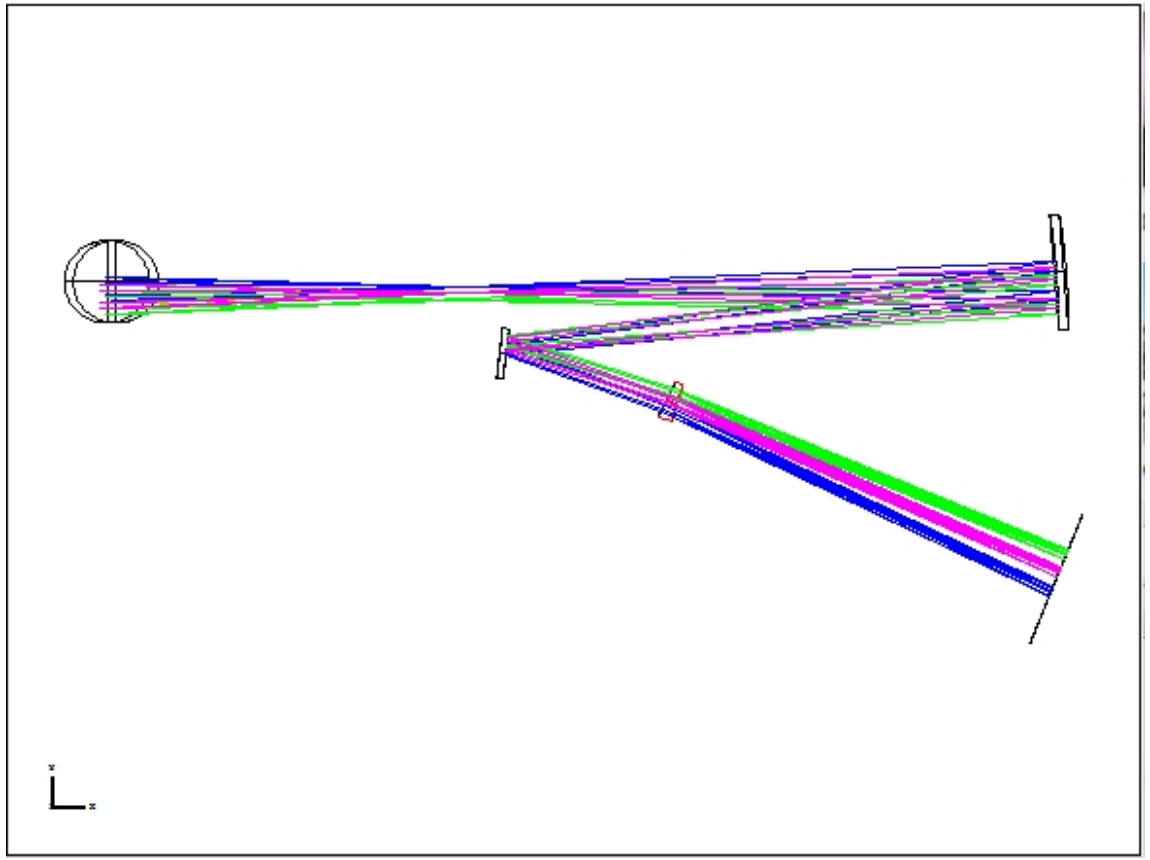
IMAGING MODE:
MgF2 extra plate for focus
Pupil free position



SPECTRAL MODE:
LiF prism R 600 at 1210 A

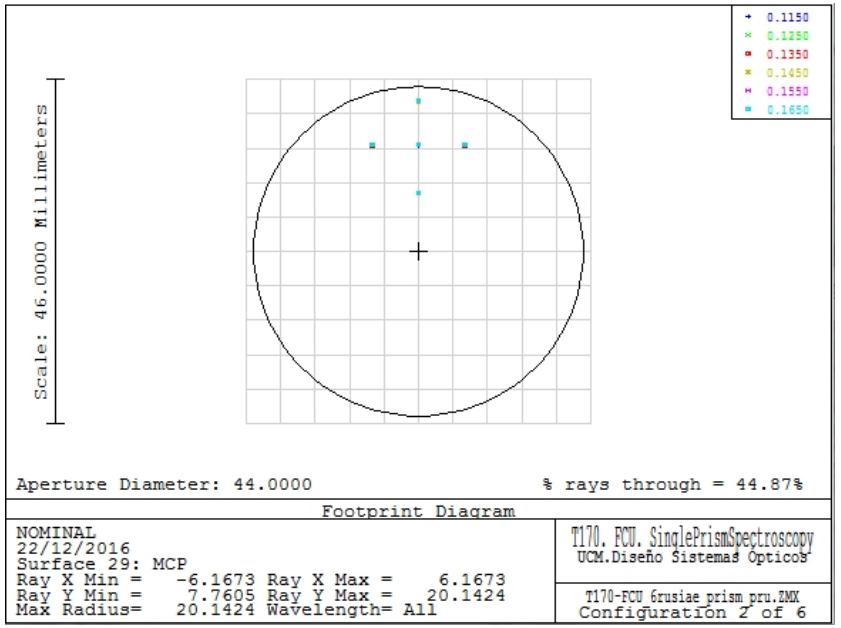


SPECTRAL MODE: CHARACTERISTICS

Central field

R given in three pix at 15micron /pix

Lambda, nm	PSF ee80		Total elemento*	Disp nm/micra	R
121.5	20		45		600
1305	21		45		336
1335	21		45		285
1402	21		45		202
1550	22		45		114
1640	22		45		95



PSF SIZE is defined by encircling 80% of the energy in the Y axis (<< 3 pixels).
Hence, size of the resolution element: 3 pix, or 45 micras.
R varies by less than 1% for different positions in the field

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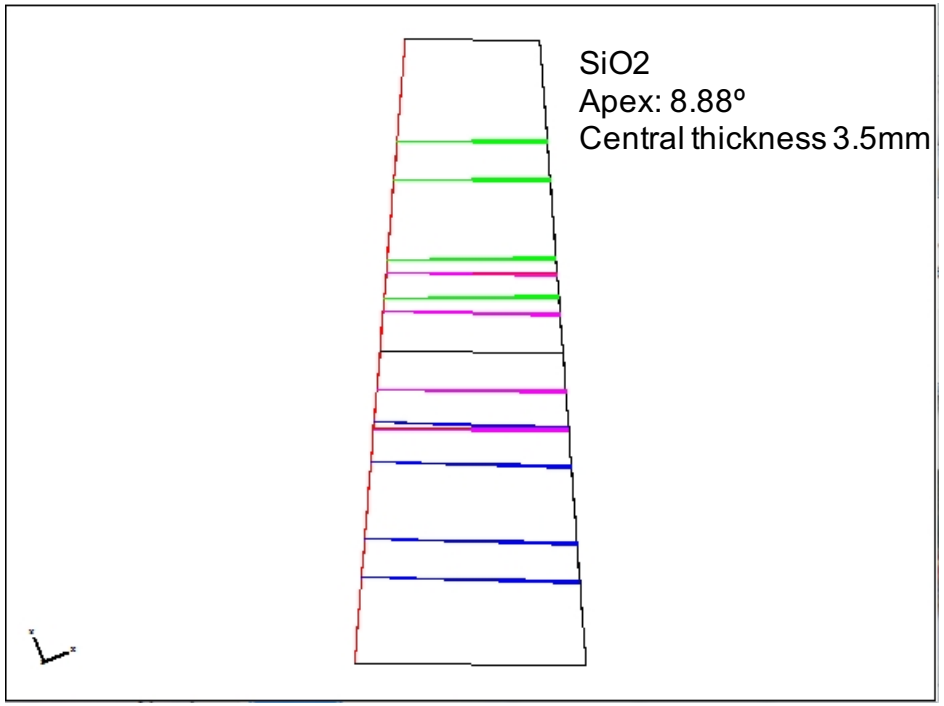
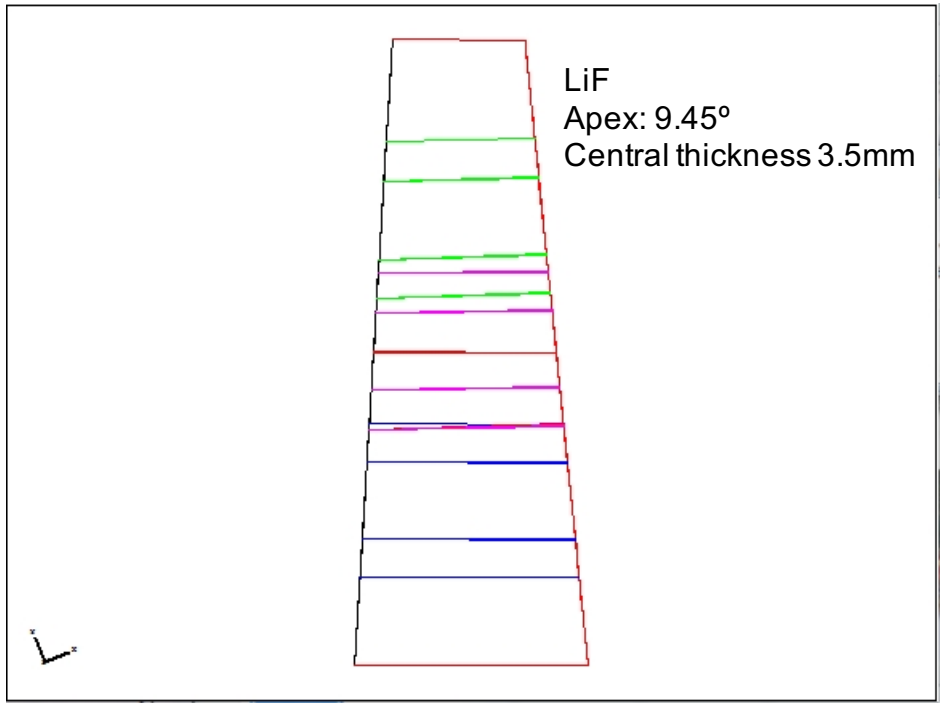
DISPERSIVE ELEMENTS: PRISMS PROPERTIES

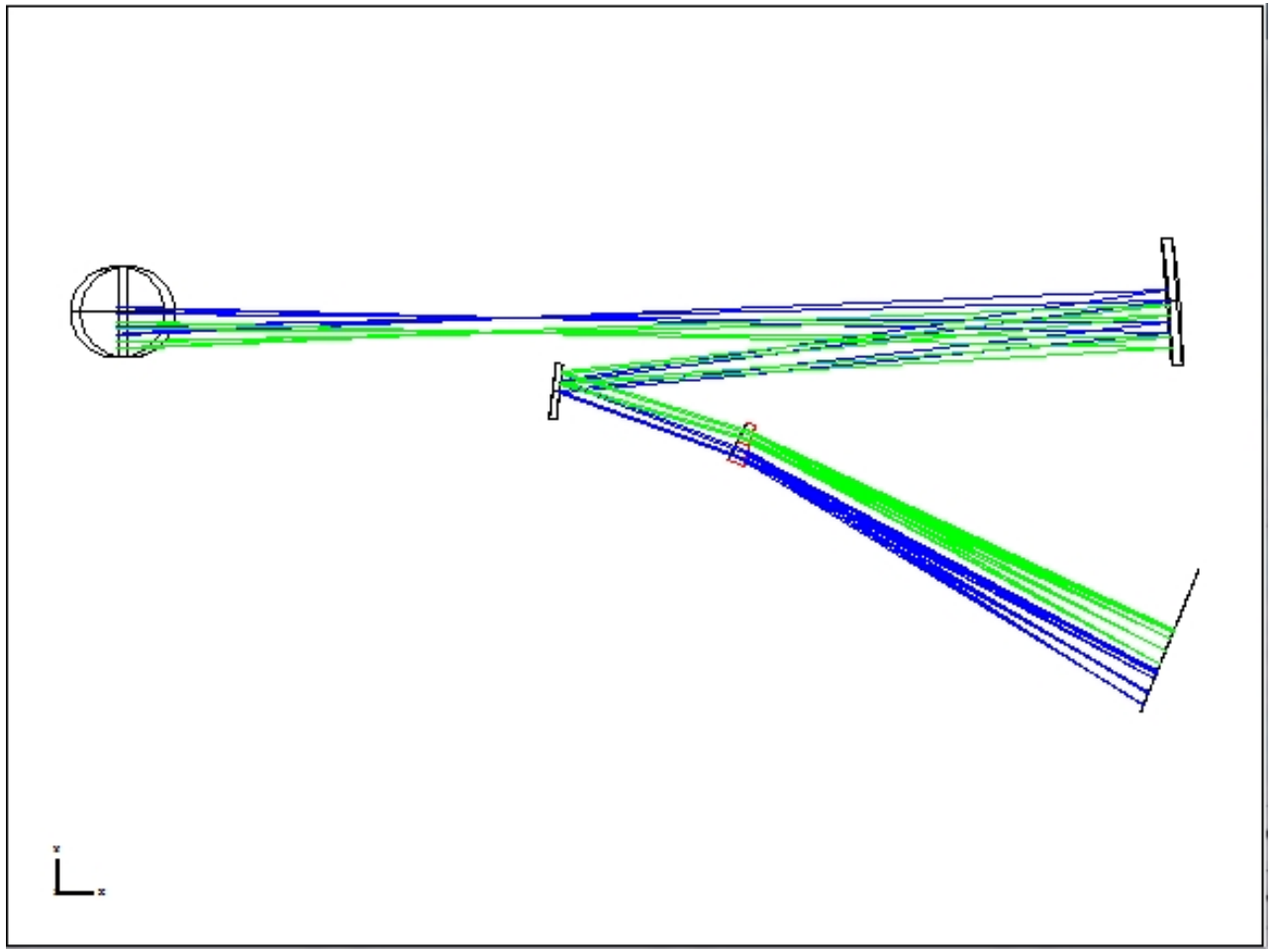


Lambda	Fresnel SiO2		Scattering	Absorption (SiO2)	**TOTAL**
	Face 1	Face 2			
1550A	0.91 uncoated	0.91 uncoated	0.96	1	**0.79**
1550A	0.96 coated	0.96 coated	0.96	1	**0.88**



Lambda	Fresnel LiF		Scattering	Absorption (LiF)	**TOTAL**
	Face 1	Face 2			
1215A	0.94 uncoated	0.94 uncoated	0.96	1	**0.84**

SPECTRAL MODE: SIO2 PRISM
R-> 600 AT 1550A



FCU DETECTOR

PLANNING

Entrega de la información detallada del modelo estructural y térmico para su desarrollo por INASAN: **septiembre 2018**

Entrega del modelo de ingeniería para cualificación (modelo y equipo de apoyo de tierra): **septiembre de 2019**

Entrega del modelo de vuelo (modelo y equipo de apoyo de tierra): **mayo de 2020** **DELIVERY FLIGHT MODEL**

MODES OF OPERATION

- PDD can be commanded into 2 states, ON state (power applied) and OFF state (power removed).
- When the channel is in the ON state it can be commanded into 6 operational modes:
- Standby (MCP and HVPS are off, TC/TM works fully)
- ACCUM mode full-frame readout
- ACCUM mode region-of-interest readout
- TIME-TAG mode full-frame readout
- TIME-TAG mode region-of-interest readout
- TEST mode (TC/TM works fully, calibration, testing support (debug access..), maintenance (software, purging…))
- When entering the ON state the channel will be default to standby mode

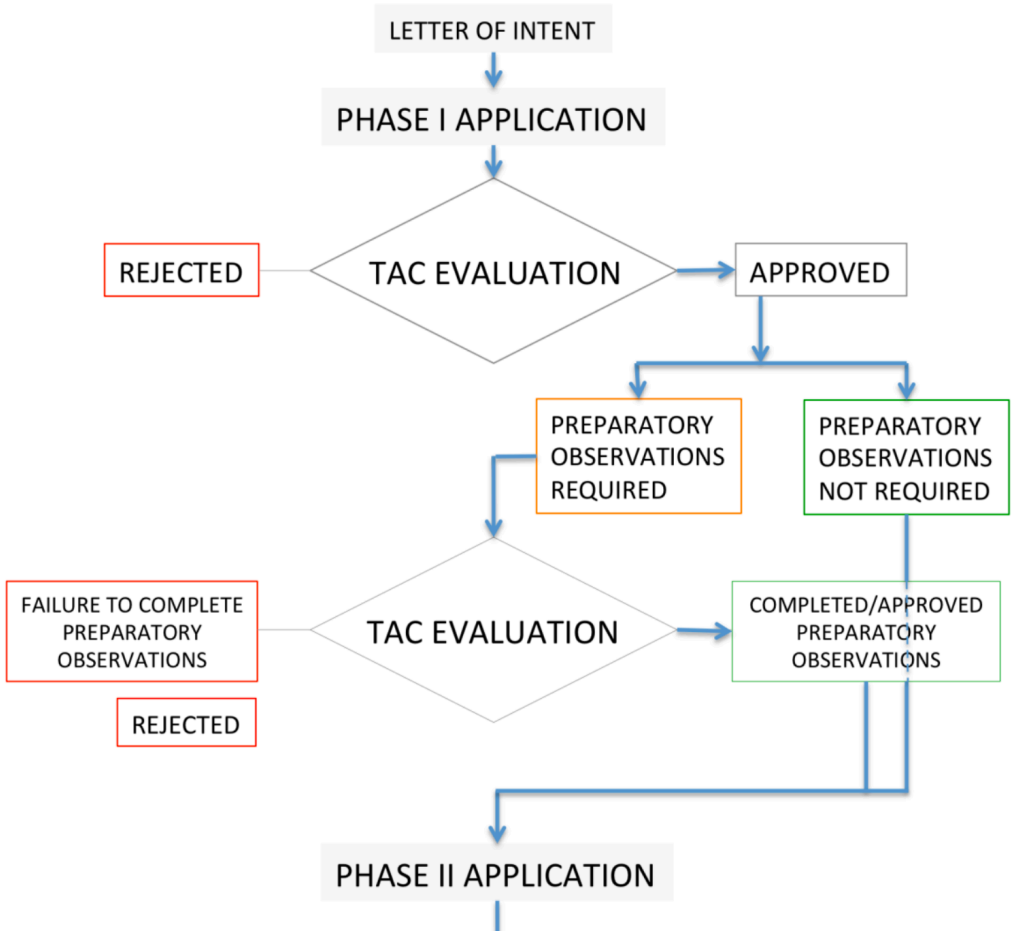
SENSITIVITY REQUIREMENTS

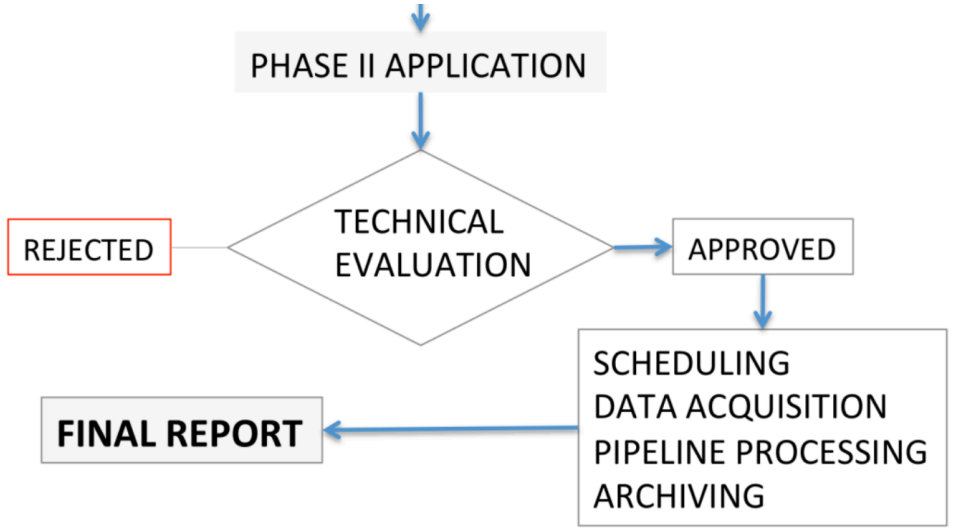
FCU-PPD-EOP-0010	**The FUV channel will operate over the spectral range 115nm-176nm**
FCU-PPD-EOP-0020	The size of the photosensitive area shall be greater than or equal to 30 mm in diameter (round)
FCU-PPD-EOP-0030	FUV detector resolution (PSF FWHM) shall be less than 25µm (TBC) at 120nm and less than 15µm (TBC) at 175nm.
FCU-PPD-EOP-0040	The quantum Efficiency at 120 nm shall be greater than or equal to 20 %
FCU-PPD-EOP-0050	The quantum efficiency at 150 nm shall be greater than or equal to 15 %
FCU-PPD-EOP-0060	The quantum Efficiency at 175 nm shall be greater than or equal to 5 %
FCU-PPD-EOP-0070	The quantum Efficiency shall not deviate more than 1% from its nominal value at +20C over the detector temperature operation range.
FCU-PPD-EOP-0080	The quantum Efficiency for wavelength greater than 200nm shall be less than 10^{-5}.
FCU-PPD-EOP-0090	In the region-of-interest mode, the PDD radiometric non-linearity shall be lower than 10% for incoming fluxes of 450cps (TBC) over an area of 60µmx60µm (TBC) of the MCP input.
FCU-PPD-EOP-0100	In the full-frame readout mode, the PDD radiometric non-linearity shall be lower than 10% for incoming fluxes of 5 cps (TBC) per pixel over the full frame.
FCU-PPD-EOP-0110	In the full-frame readout mode, the FUV detector radiometric non-linearity shall be lower than 1% for incoming fluxes of 200,000 cps (TBC) over the active area of the MCP input.
FCU-PPD-EOP-0120	The FUV detector shall withstand exposure to incoming fluxes of 450cps (TBC) over an area of 60 μm^2 (TBC) of the MCP input.
FCU-PPD-EOP-0130	The FUV detector geometric distortion shall be modelled on-ground so that the distortion modelling error is less than 2µm (TBC) with respect to the MCP input.
FCU-PPD-EOP-0140	It shall be able to change the location of the region of interest in the detector during the tests and during the mission lifetime.
FCU-PPD-EOP-0150	The dynamic range in ACCUM mode shall be greater than or equal to 10000:1
FCU-PPD-EOP-0160	The Photo Response Non-Uniformity shall be less than 2% at 150 nm
FCU-PPD-EOP-0170	The photometric instability shall not be more than 3% for ten hours
FCU-PPD-EOP-0180	The photometric instability shall not be more than 5% for one month
FCU-PPD-EOP-0190	The geometric stability of the received image in the whole range of the input signal, shall be <5 microns on photocathode
FCU-PPD-EOP-0200	Temporal resolution in TIME-TAG mode should me no less than 4 ms
FCU-PPD-EOP-0210	Datation accuracy in TIME-TAG mode should me no less then 0.4 ms
FCU-PPD-EOP-0220	At the start of service the dark current shall not be greater than 10 cps/cm2 at 20C
FCU-PPD-EOP-0230	At the end of service the dark current shall not be greater than 20 cps/cm2 at 20C

PARTICIPATION IN SCIENTIFIC OPERATIONS

- DESIGN AND SOFTWARE DEVELOPMENT
- SUPPORT THE COMMUNITY IN CALLS RELATED ACTIVITIES

Proposal Life Cycle: Is the period lasting from the application for observing time, after the announcement of opportunity by the WSO-UV International Observatory, to the final release of the data to the PI.





The WSO-UV Core Programme Team. 4/5 scientists with the following responsibilities:

- Reviewing the CP Management Plan in all its dimensions. To assess in detail the resources available in the CP Teams (manpower, expertise, hardware, and software), and whether they are adequate to the demands of their proposal. The WCPT also evaluates the proposed data (HLSD) products to be delivered to WSO-UV and whether they are suitable to fulfil the goal of serving a broad community.
- Taking part in the science verification of WSO-UV and collaborating to finalise PHASE2 tools
- Participation to the definition of the WSO-UV standard calibration plan, as well as the configuration of the Quality Control (QC) parameters in the pipeline.
- Support the PI's to optimize the scheduling of the observations (Phase 2). To ensure that the survey strategy (dither size and pattern, tiling, field selection, sky conditions, moon phase, etc.) is compatible with the attributes of WSO-UV, and with the goals of the respective CP.
- Basic monitoring the progress of the CP. To oversee the data transfer from the Observatory to the teams, to monitor PHASE 2 progress, delivery of data products from the CP Teams to the WSO-UV archive, in terms of keeping to the agreed upon delivery schedule, product types, and quantity.
- Validating Survey Data Products. The WCPT will act as a referee and will base its assessment of the data quality of the survey products, on the quality control parameters, and the detailed reports provided by the CP teams.
- Issuing and updating guidelines and WSO-UV standards for ingestion and digestion of data products by the WSO-UV archive.

Planning

May 2018	Call for letters of intent for the WSO-UV core program
July 2018	Deadline for the submission of letters of intent for WSO-UV core program
September 2018	Letters of intent are made public.
September 2018	Release of the call for Phase I proposals
November 2018	Deadline for submission of Phase I proposals
January 2019	TAC releases the list of approved Phase I proposals
January 2020	Call for re-submission of core program proposals requiring preparatory observations
March 2020	Deadline for re-submission of core program proposals
June 2020	TAC approves the final list of proposals
June 2020	Call for Phase II is released
January 2021	Phase II closes
June 2021	Target list complete /released/ scheduling ready
December 2021	Launch

CORE PROGRAM CONSORTIA

- DESIGN AND SOFTWARE DEVELOPMENT
- SUPPORT THE COMMUNITY IN CALLS RELATED ACTIVITIES

CORE PROGRAM PROPOSALS:
MONITORING A STELLAR FIELD (KEPLER-LIKE) FOR TRANSITS DETECTION

PREPARATORY ACTIVITIES:

- TO SELECT THE FIELD: TO IDENTIFY AREAS WITH LOW EXTINCTION TO TRACK EXOPLANETS IN LYA
- TO OPTIMIZE THE SURVEYING METHODOLOGY FOR TRANSITS