C3

A. López Ariste

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CLIMSO
at
Pic du Midi

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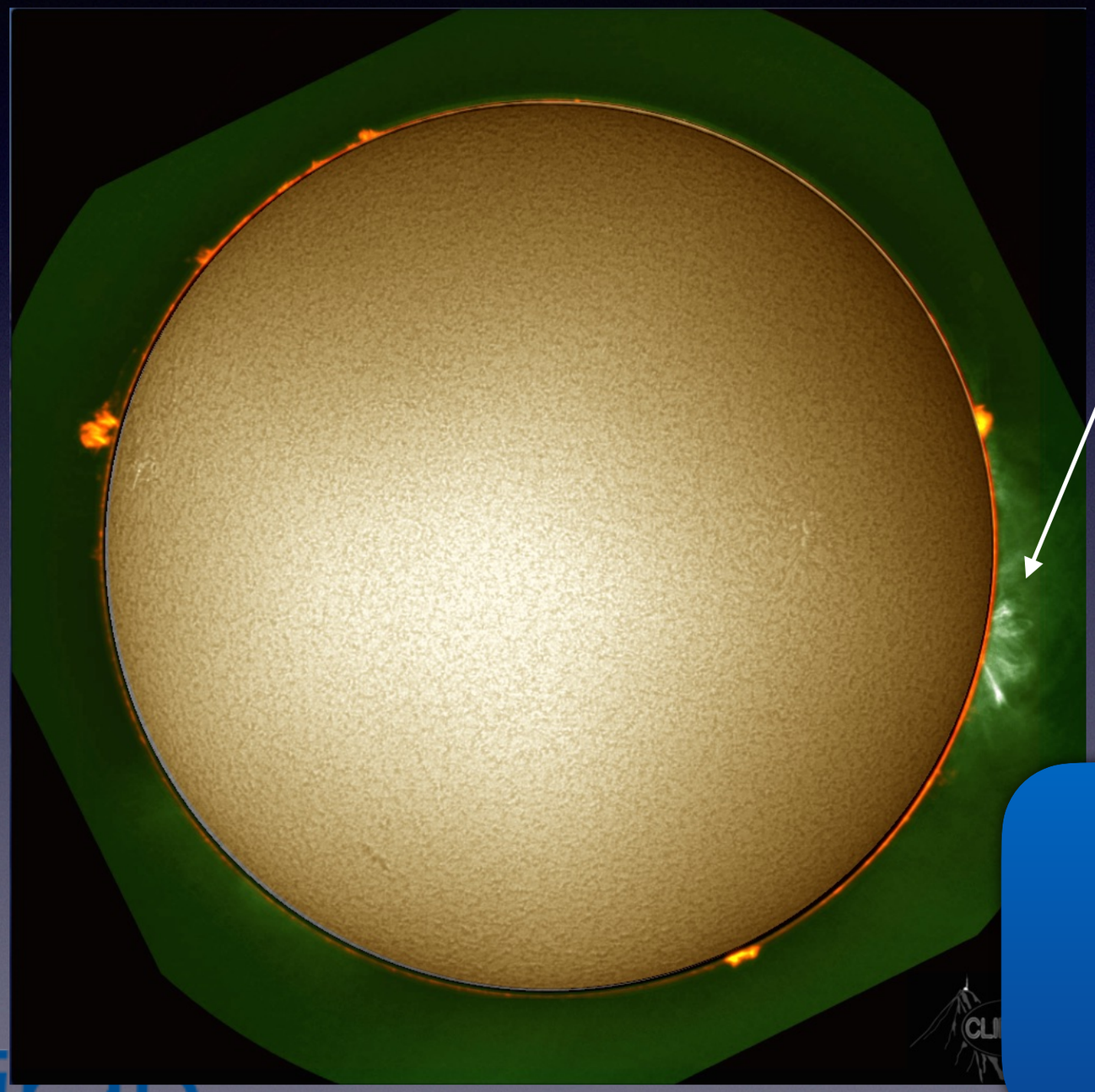
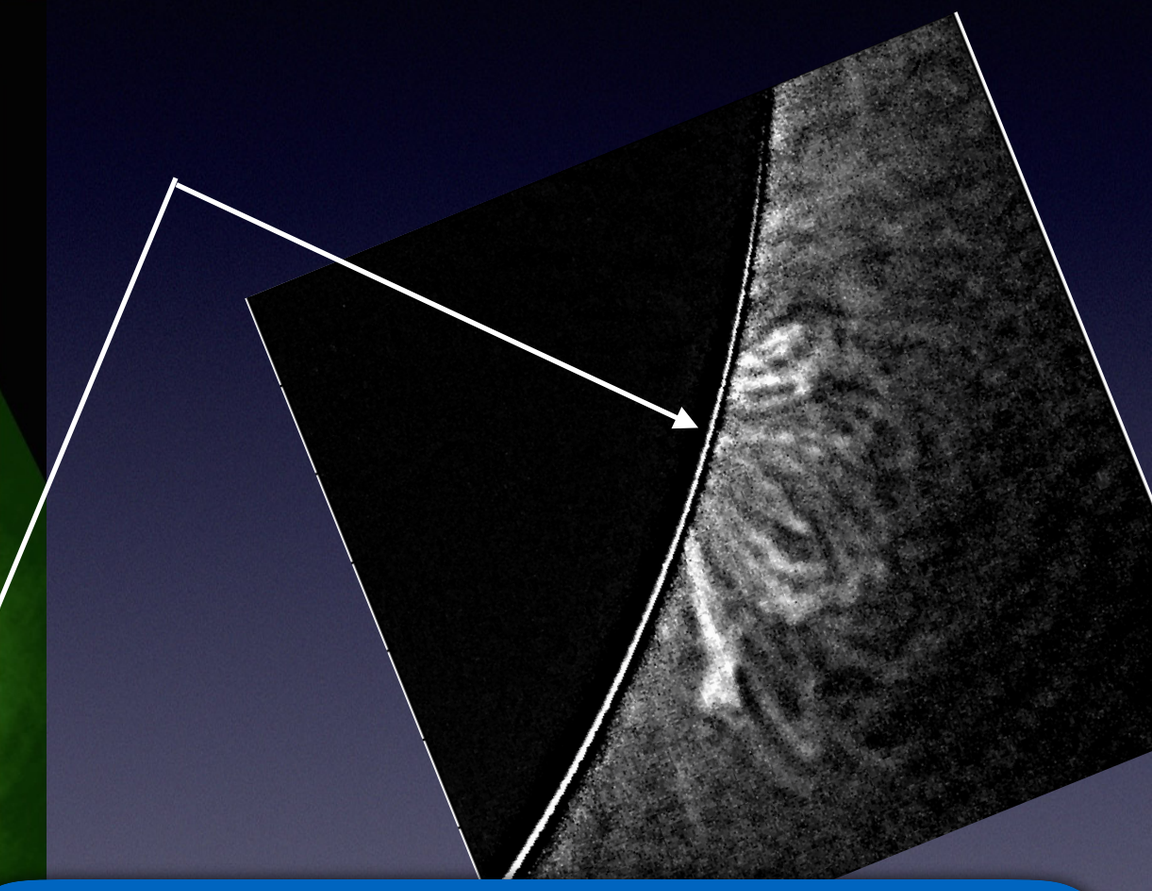
To measure coronal magnetic and velocity fields





Key words

Magnetic fields

Waves

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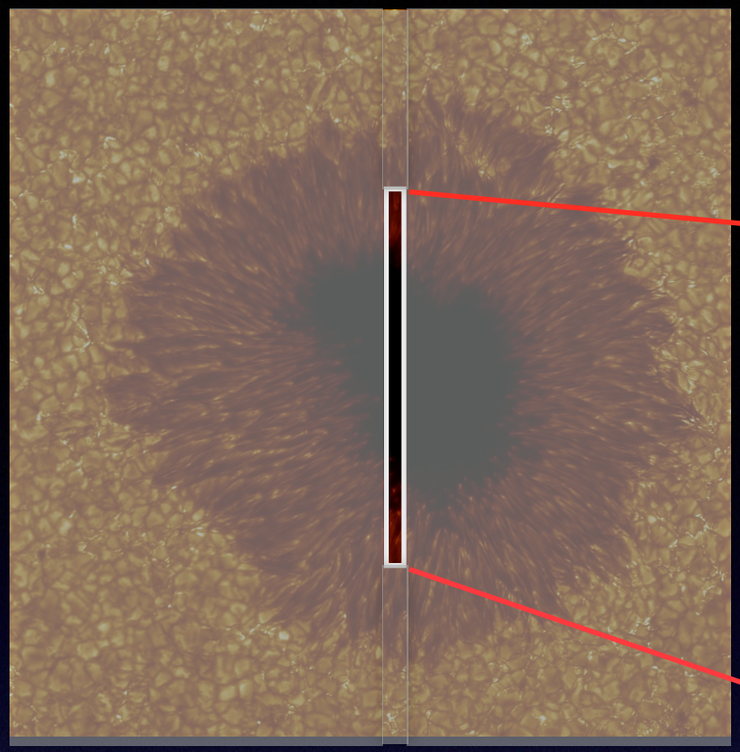
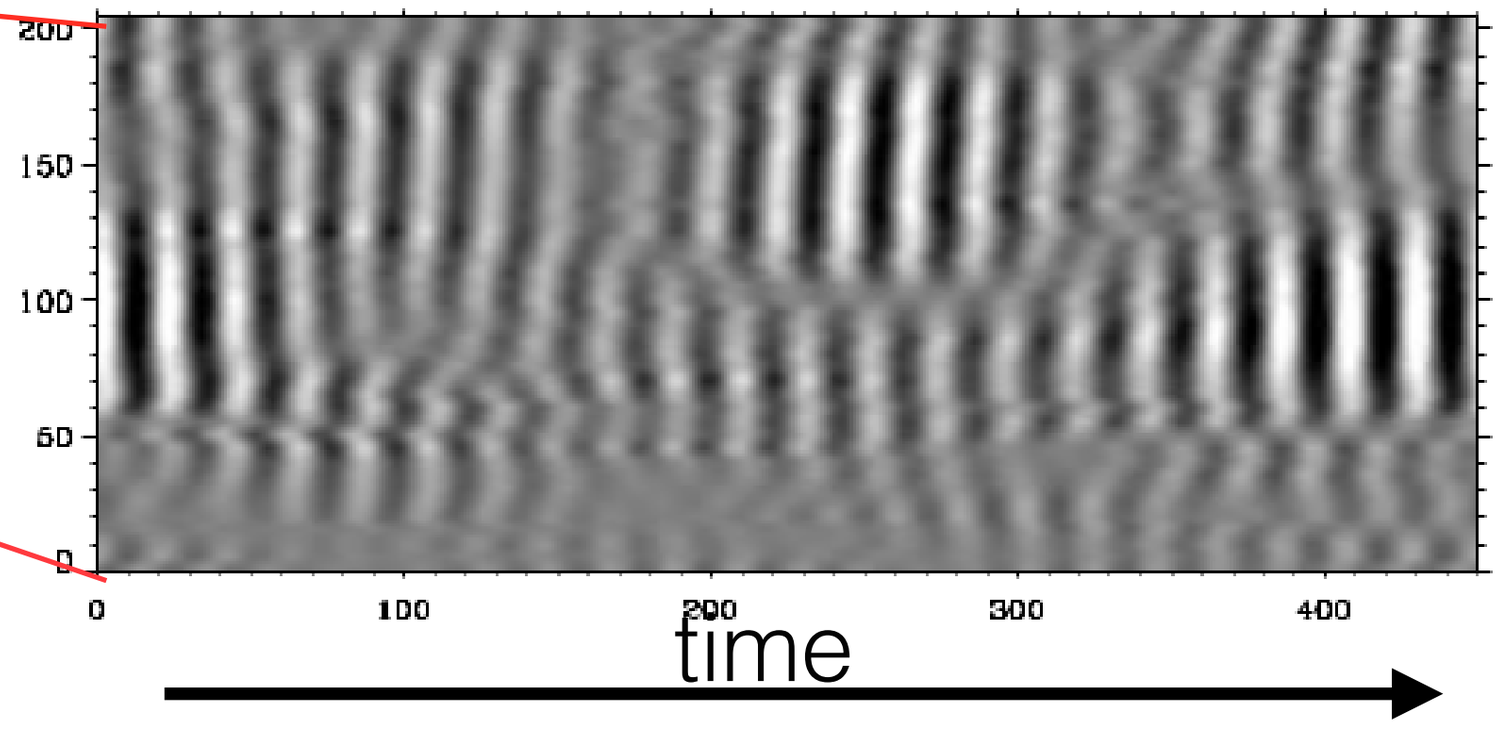
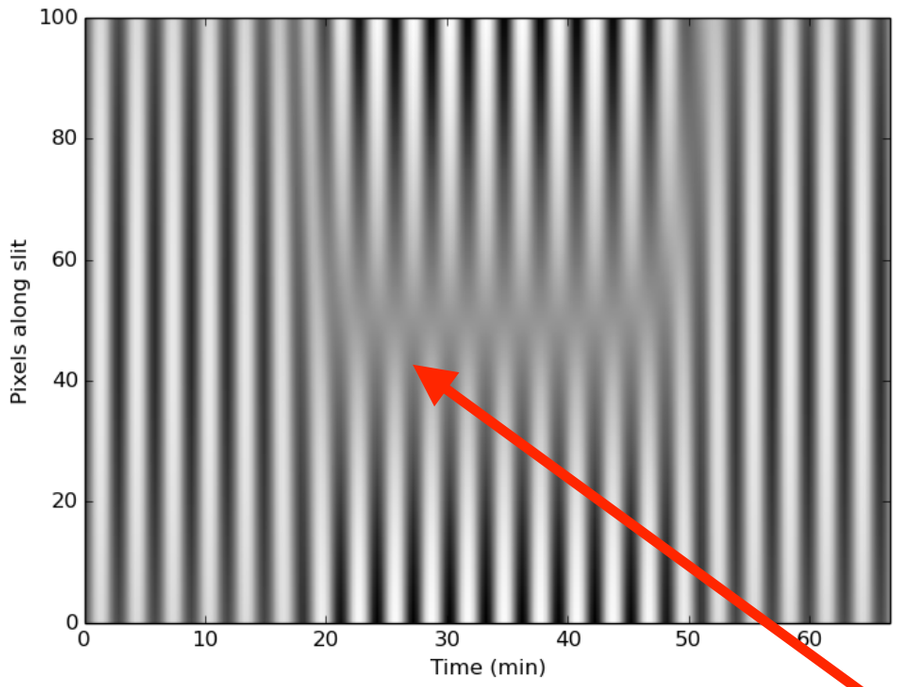
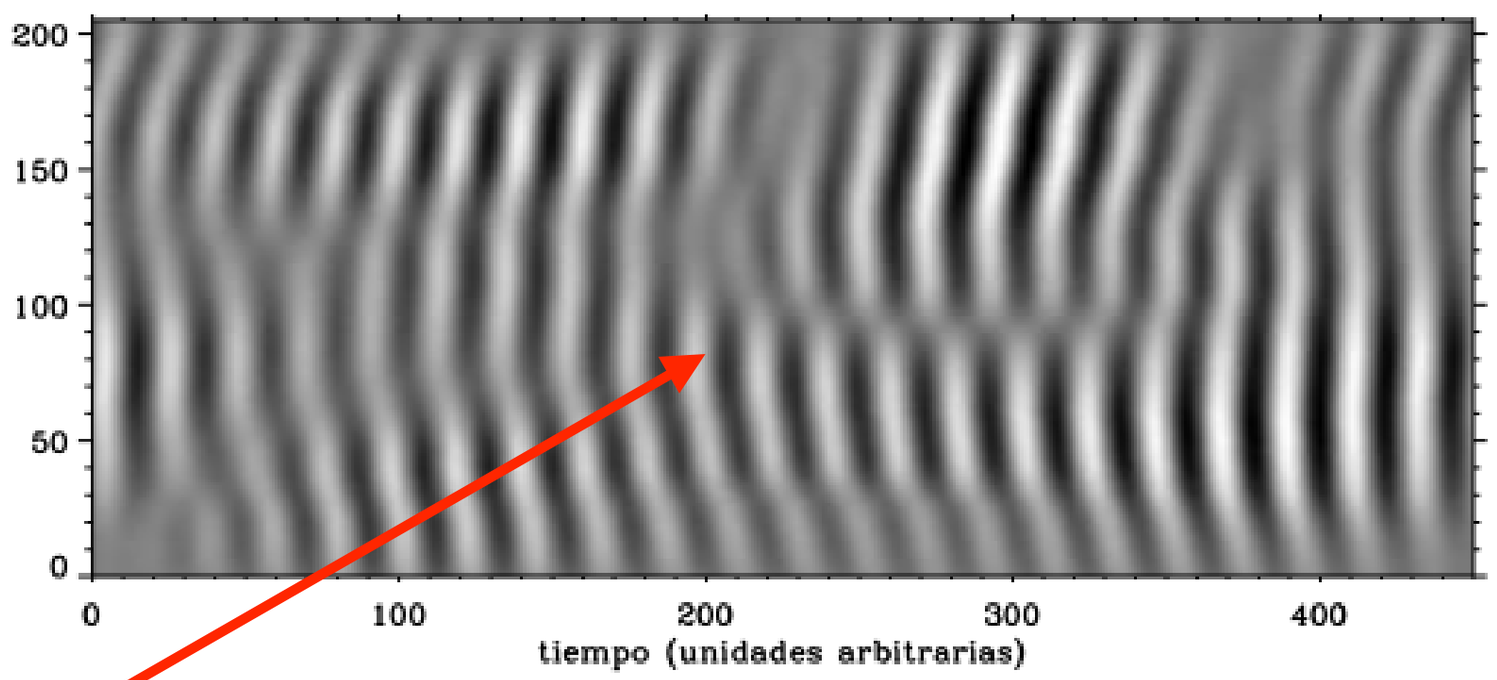
Dislocations in MHD waves: Photosphere

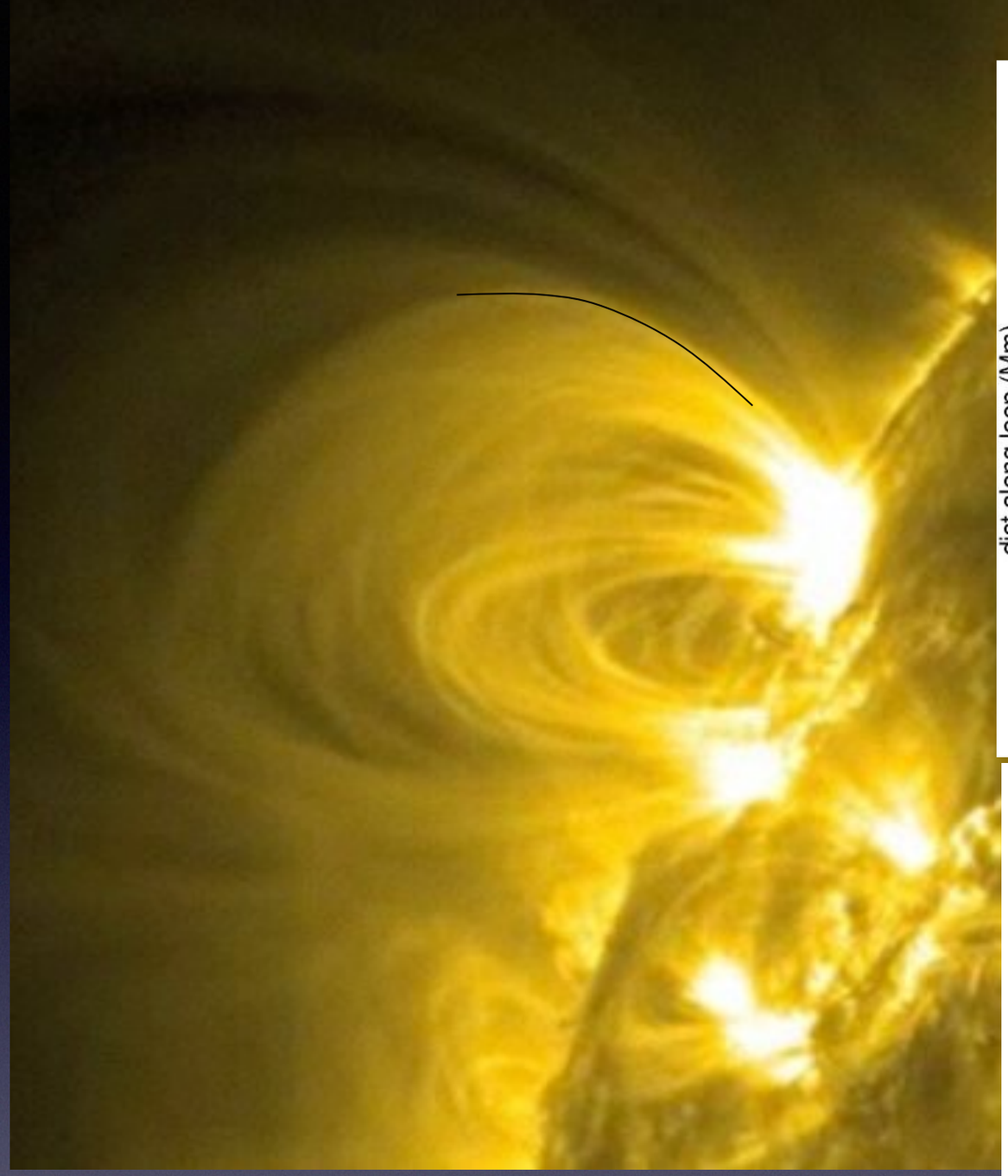








López Ariste et al. (2016)



Dislocations in MHD waves: Corona

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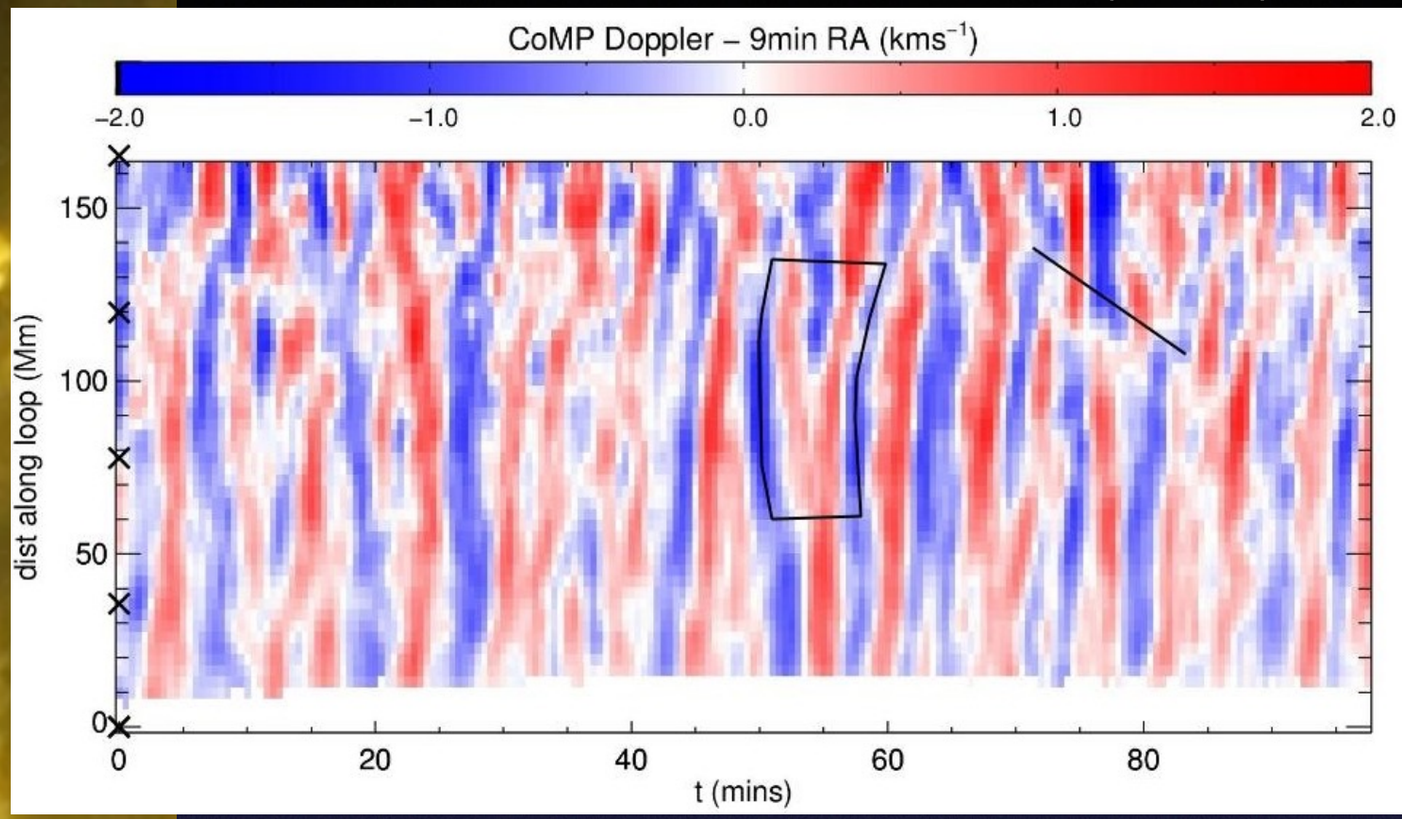
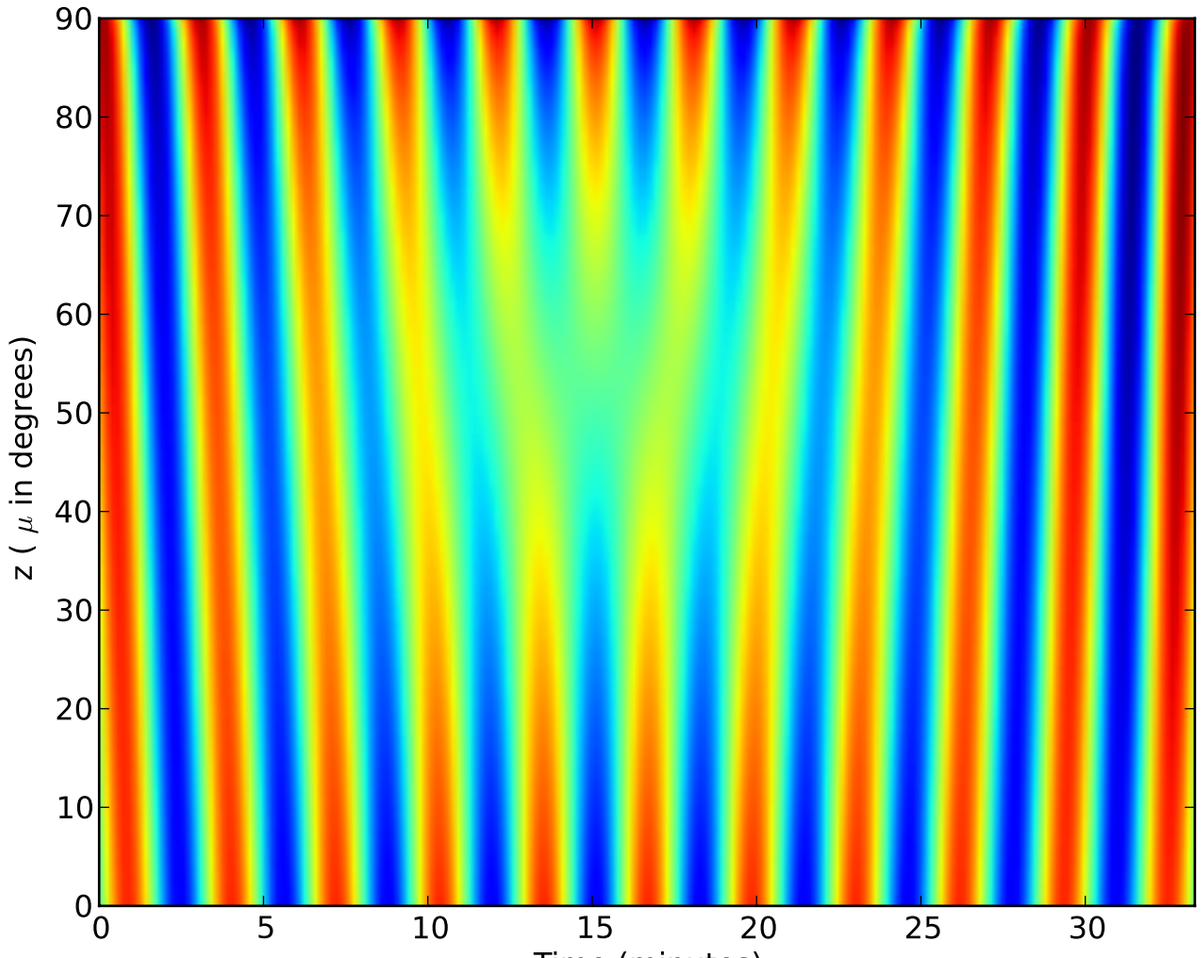
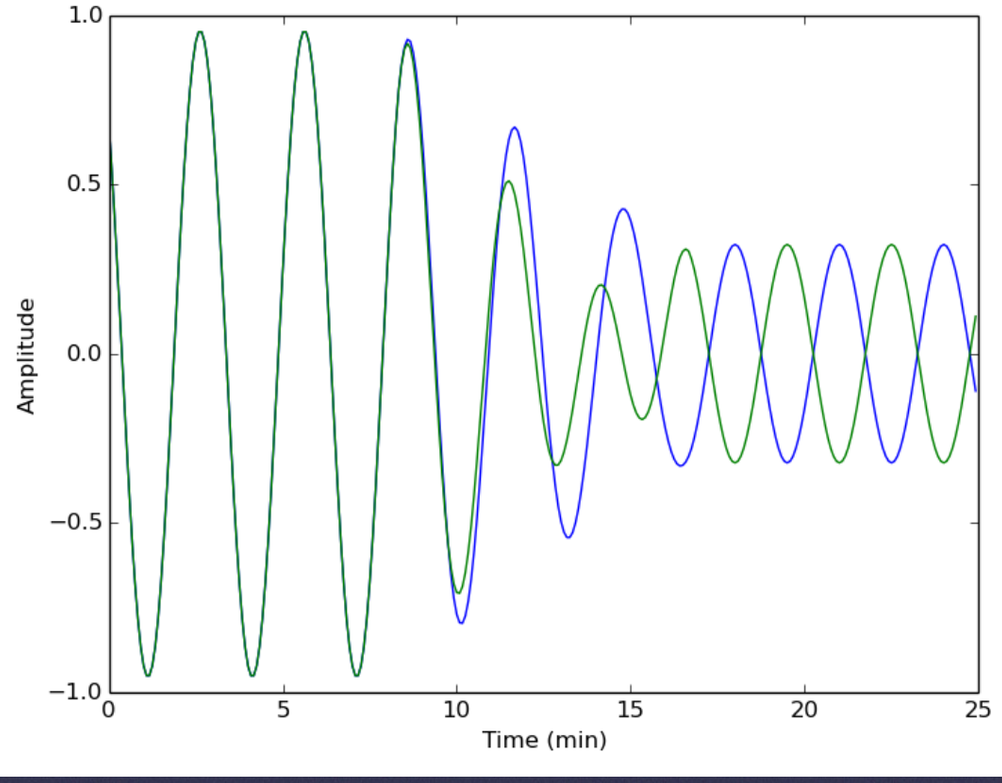
CoMP Data from Threlfall et al. (2013)

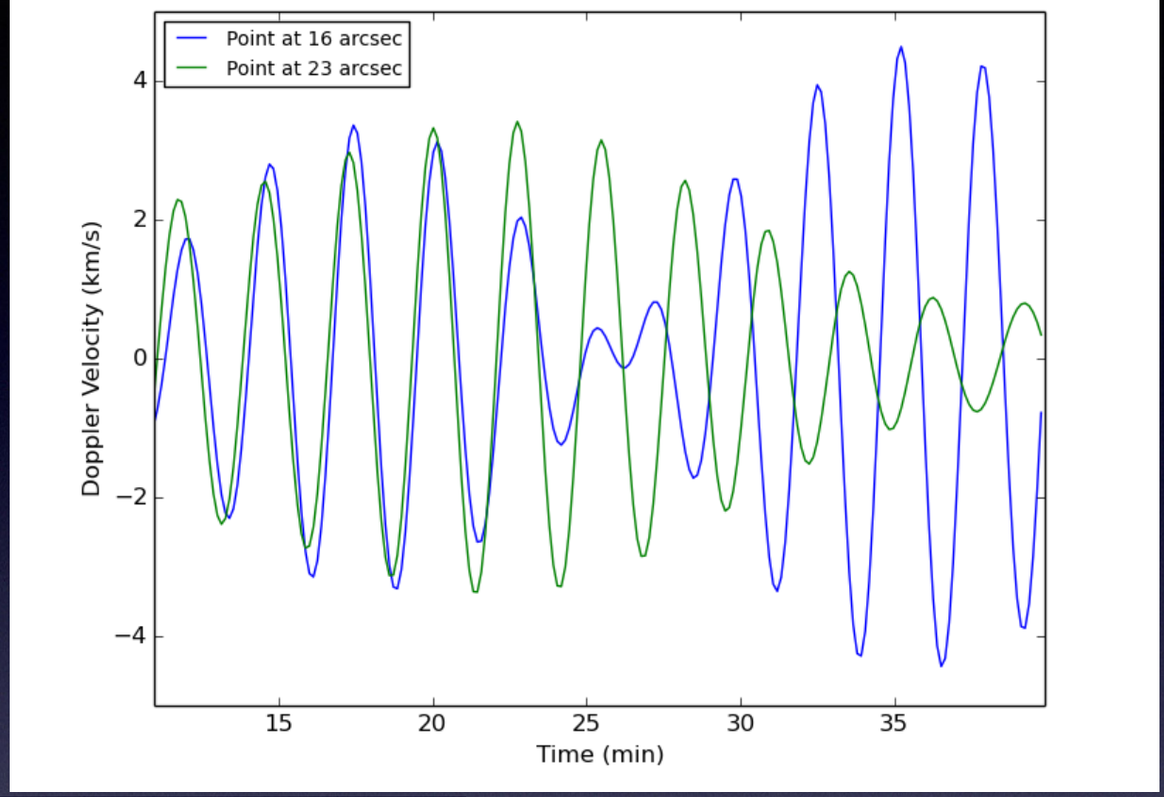


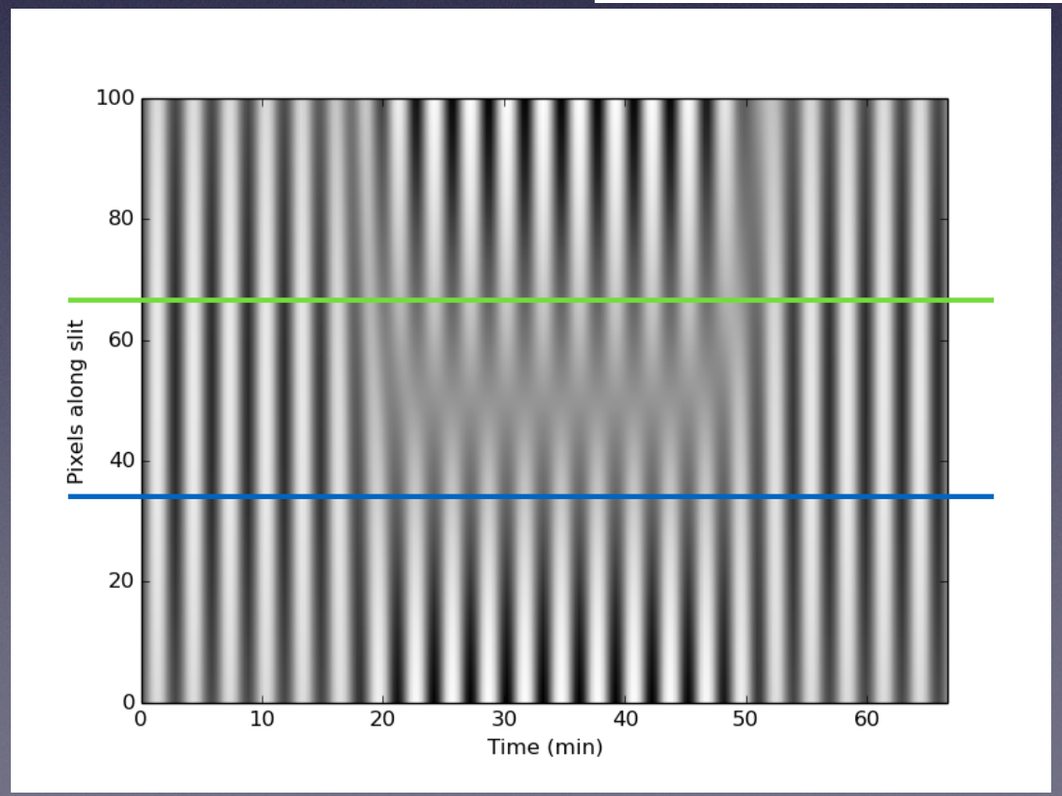
López Ariste et al. (2015)



Superoscillations







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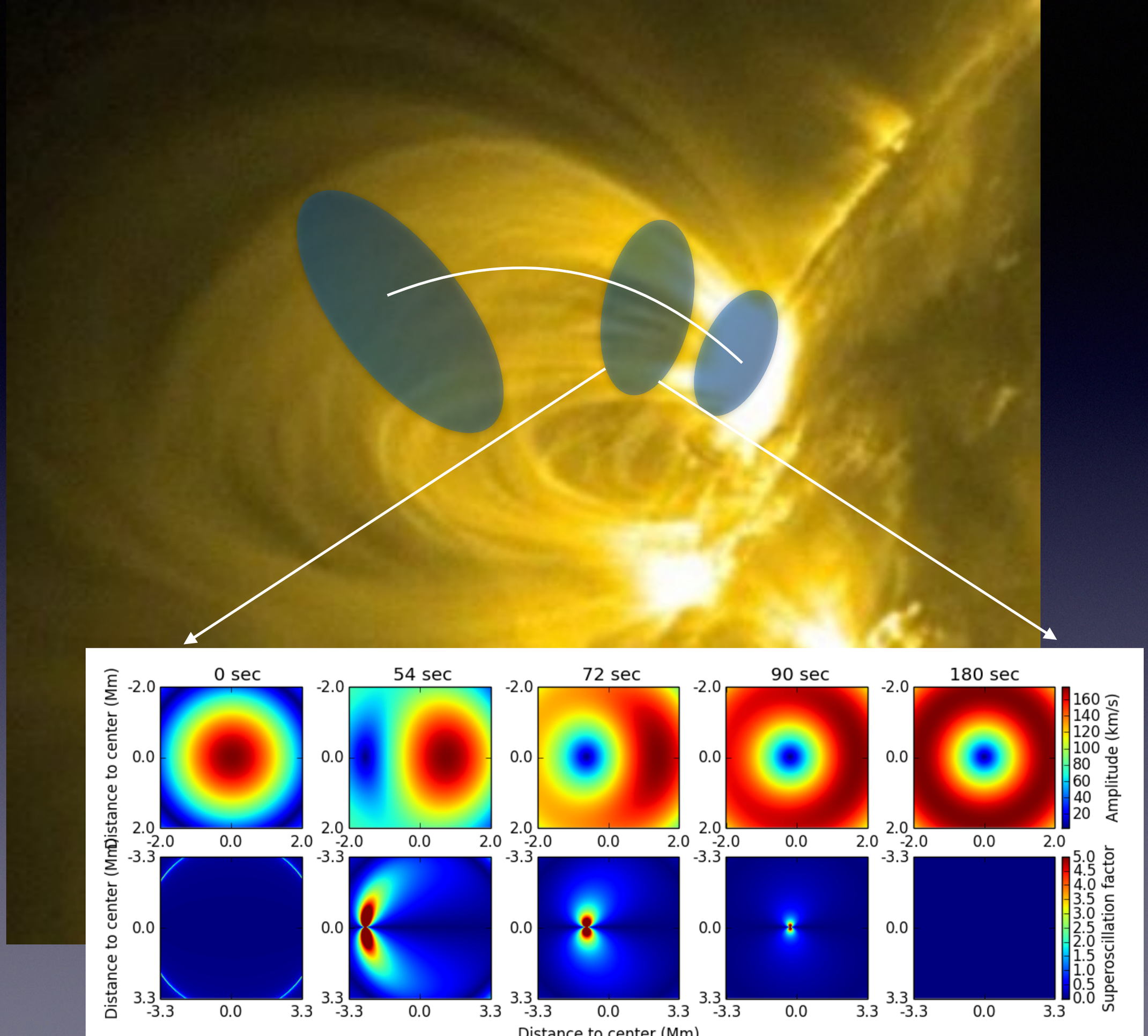

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Heating through compressive viscosity
Porter et al. (1994 a,b)
Braginskii (1965)

Coronal plasma is non-newtonian due to the magnetic field
It fits in the “strong field regime” of Braginskii

$$Q_{\mu_0} = \frac{\mu_0}{3}\left(\partial_r v_r + \frac{1}{r}\partial_\theta v_\theta + \frac{1}{r}v_r - 2\partial_z v_z\right)^2$$

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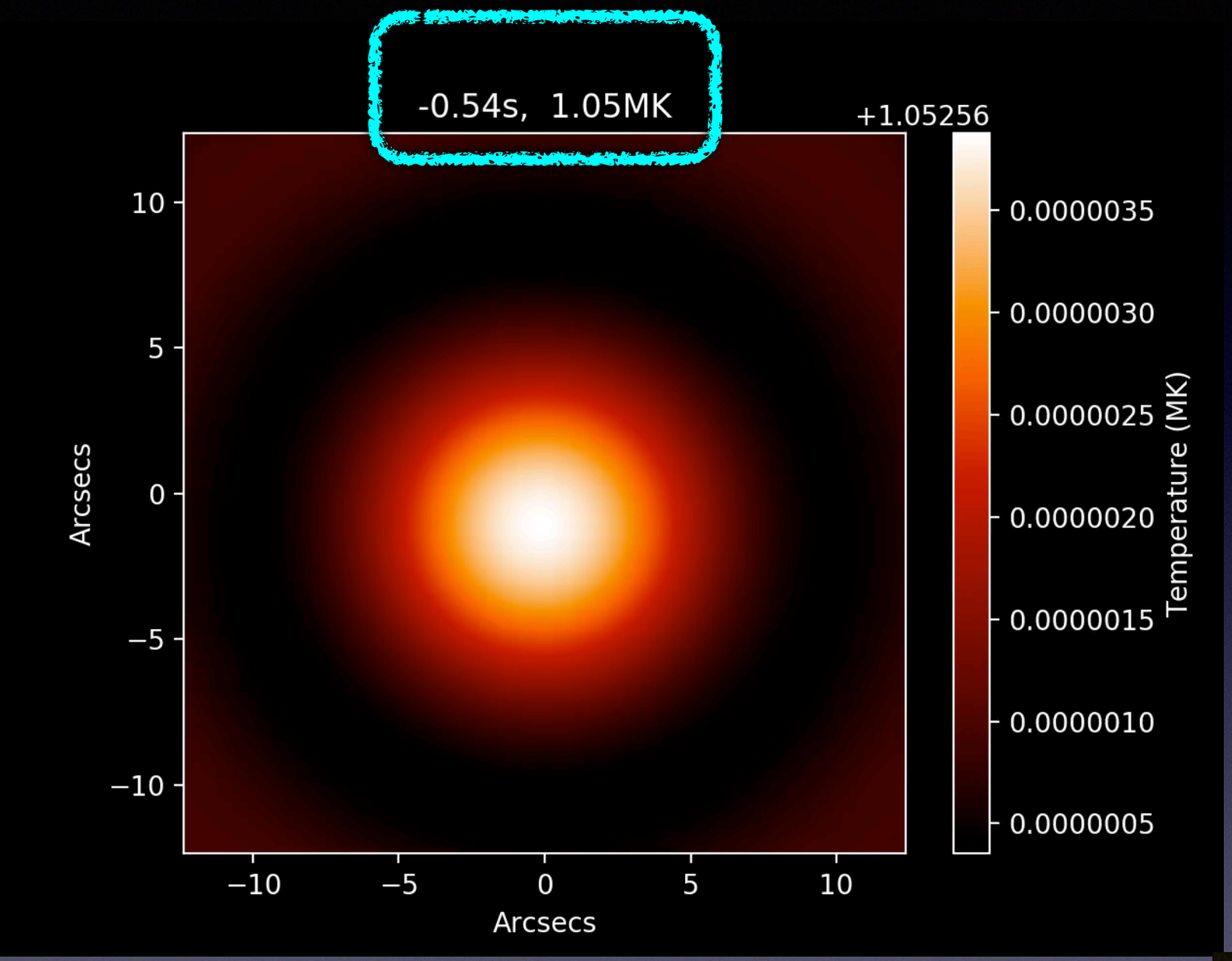
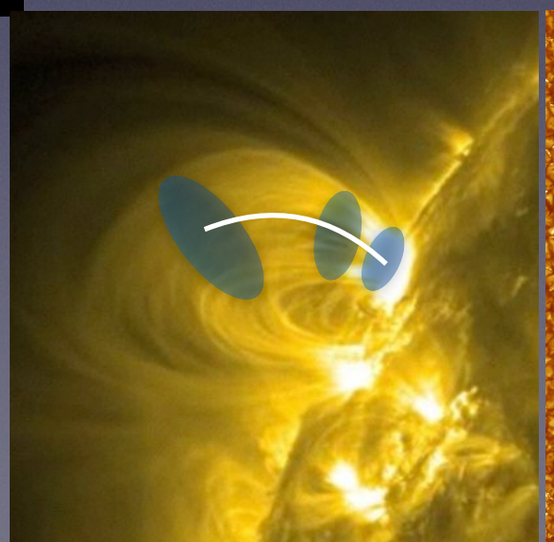
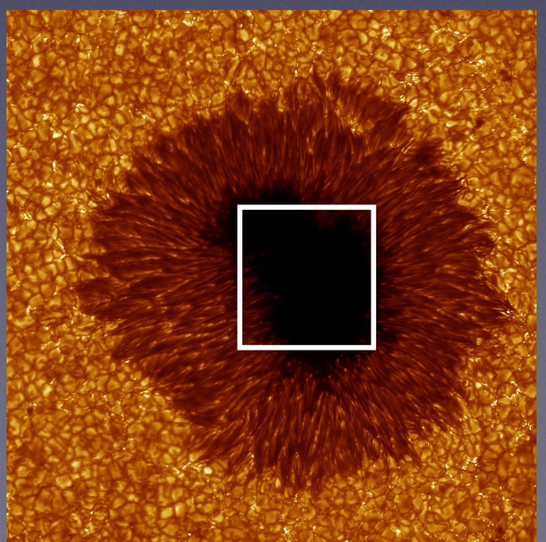
López Ariste & Facchin (2018)

Heating coronal plasma

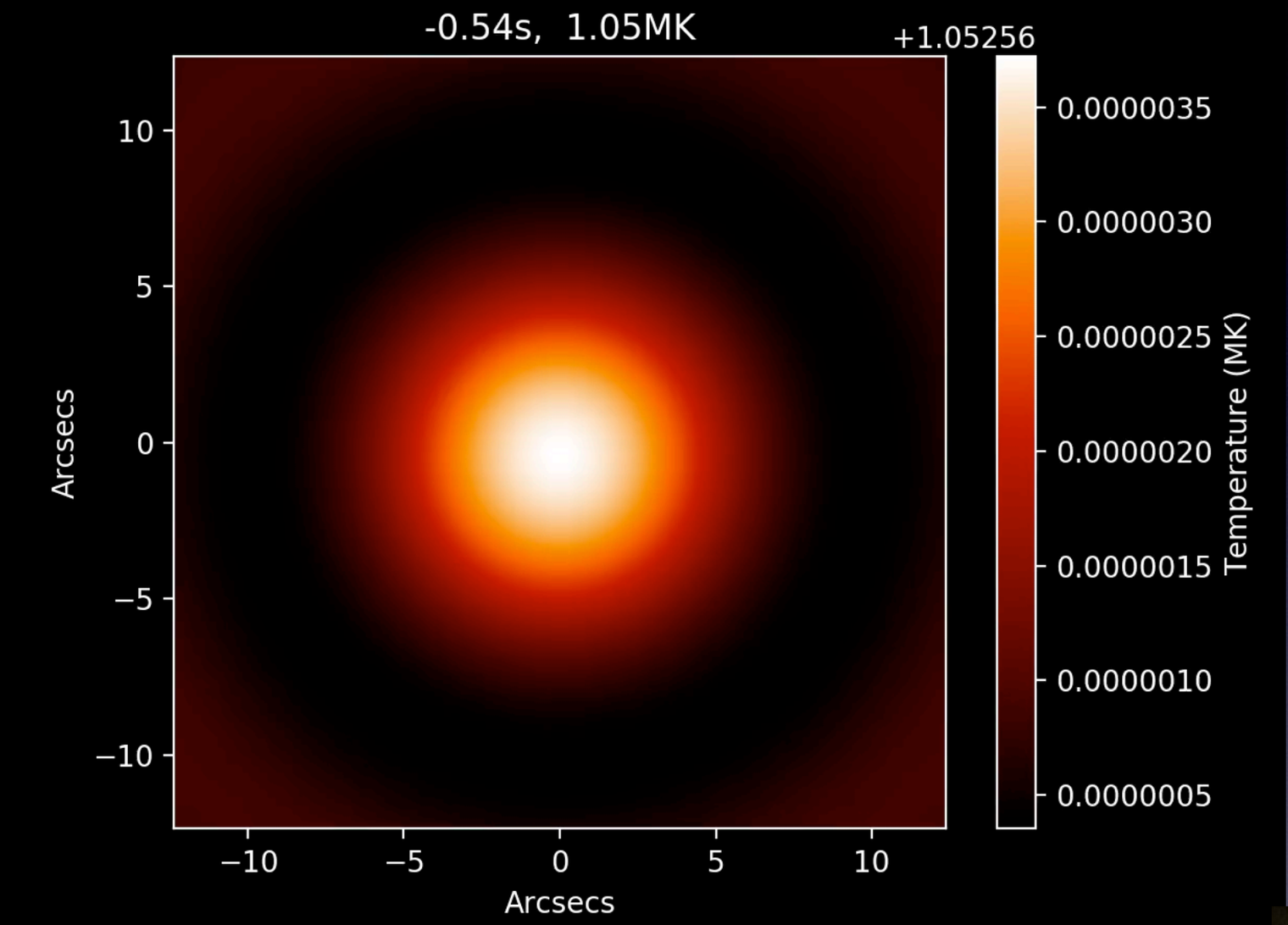


Fast heating
Localised heating



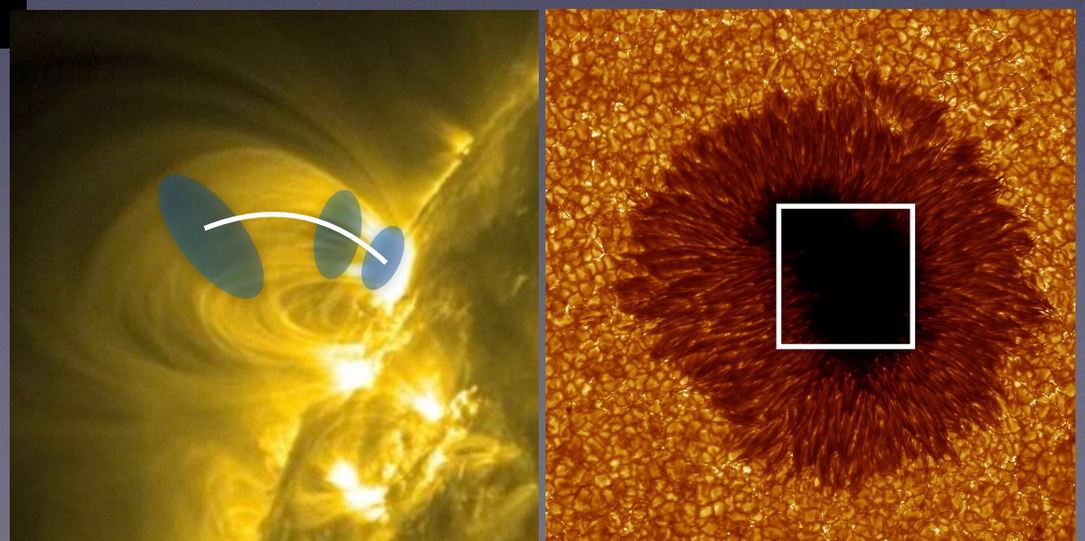


Heating coronal plasma



Fast heating
Localised heating

Diverging temperature for particular waves



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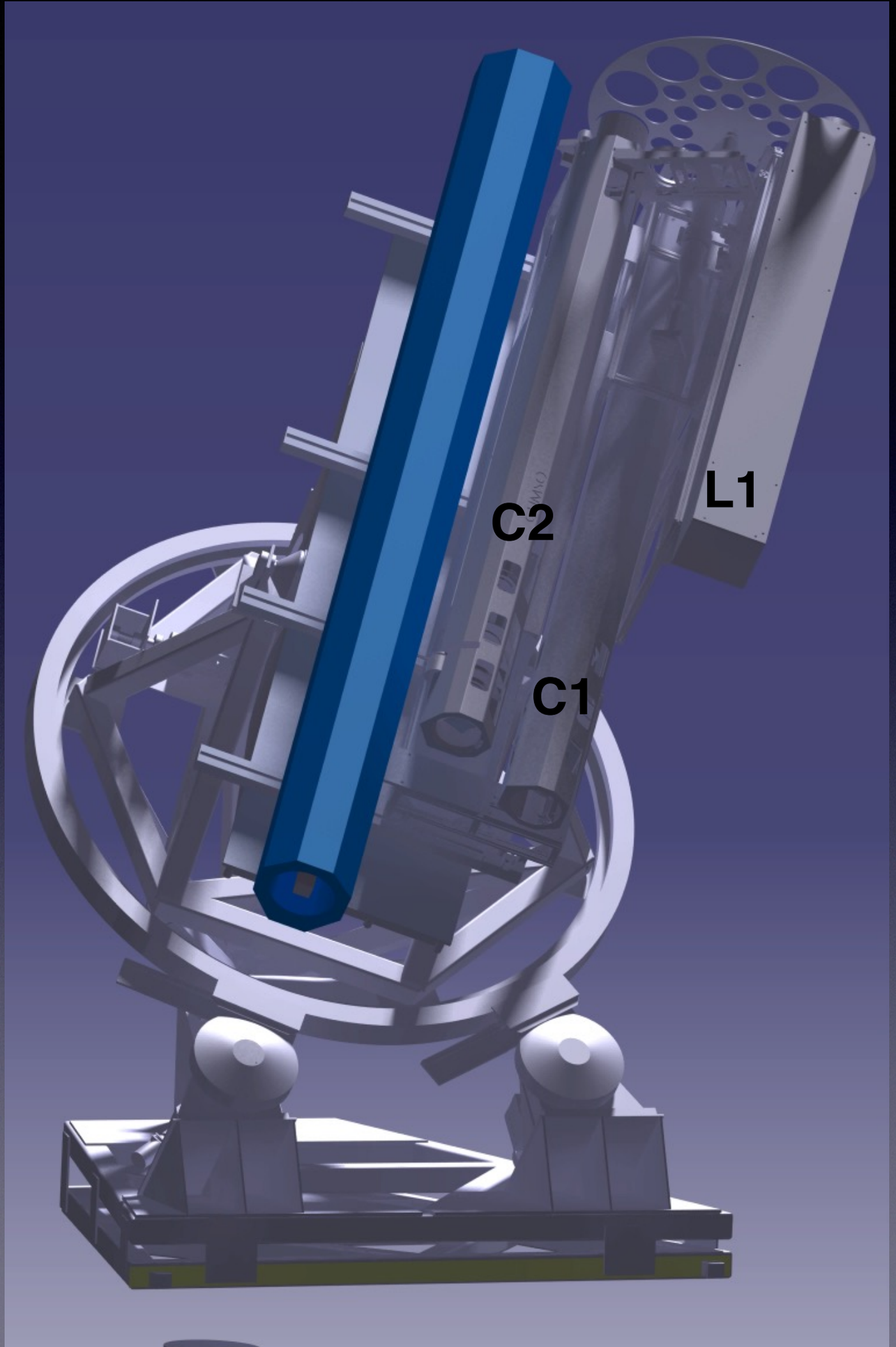

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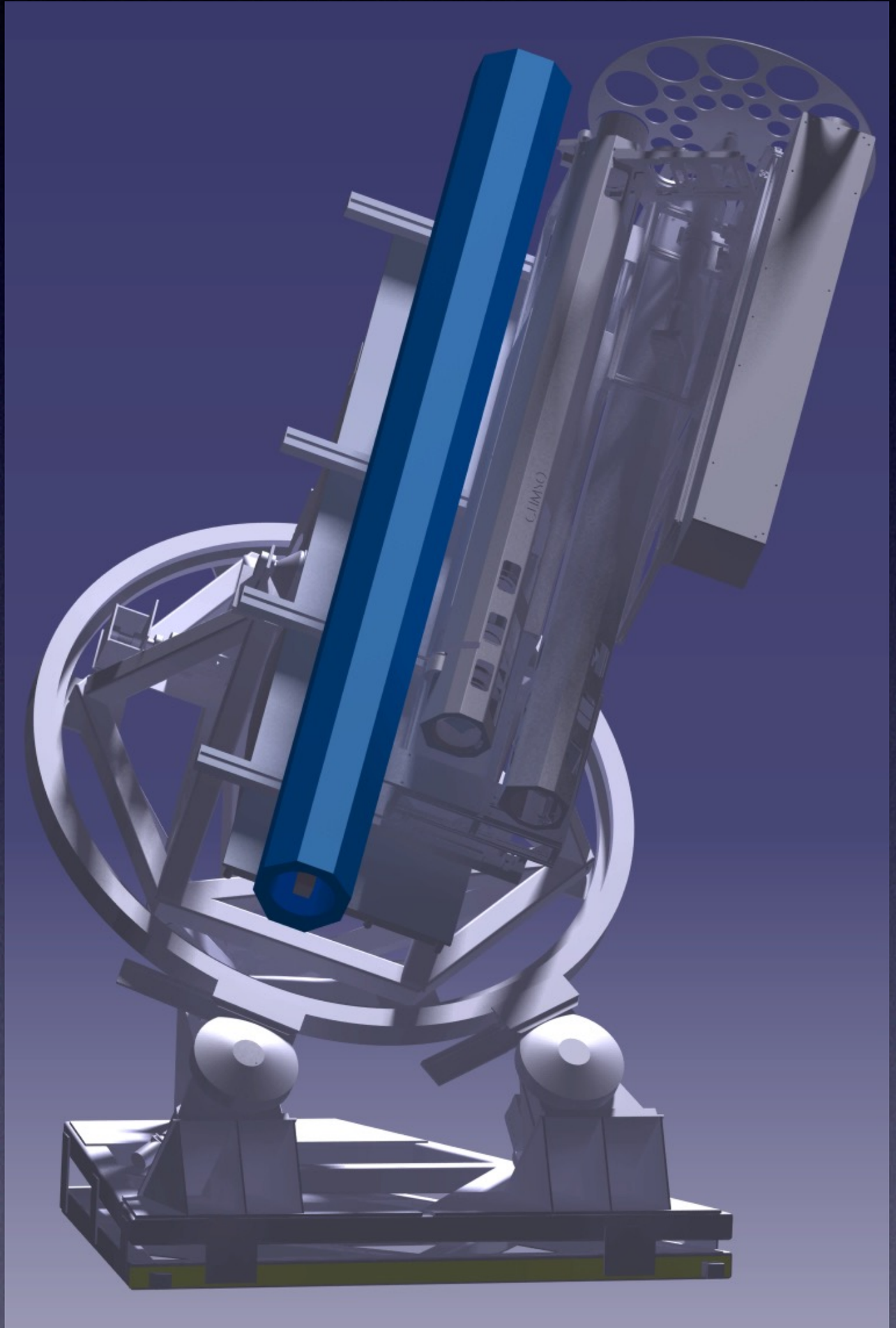
Lens Diameter: 40 cm
Focal length: 320 cm (f/8)
Length: 500 cm
FoV: 2.6 rayons solaires
Resolution: 2 “

Lyot Filter

Narrow bandwidth (0.25Å)
Fe XIV green line
Polarimetry
Aperture: 50mm
Length: 100mm
Max AoI: 3 degrés



C3

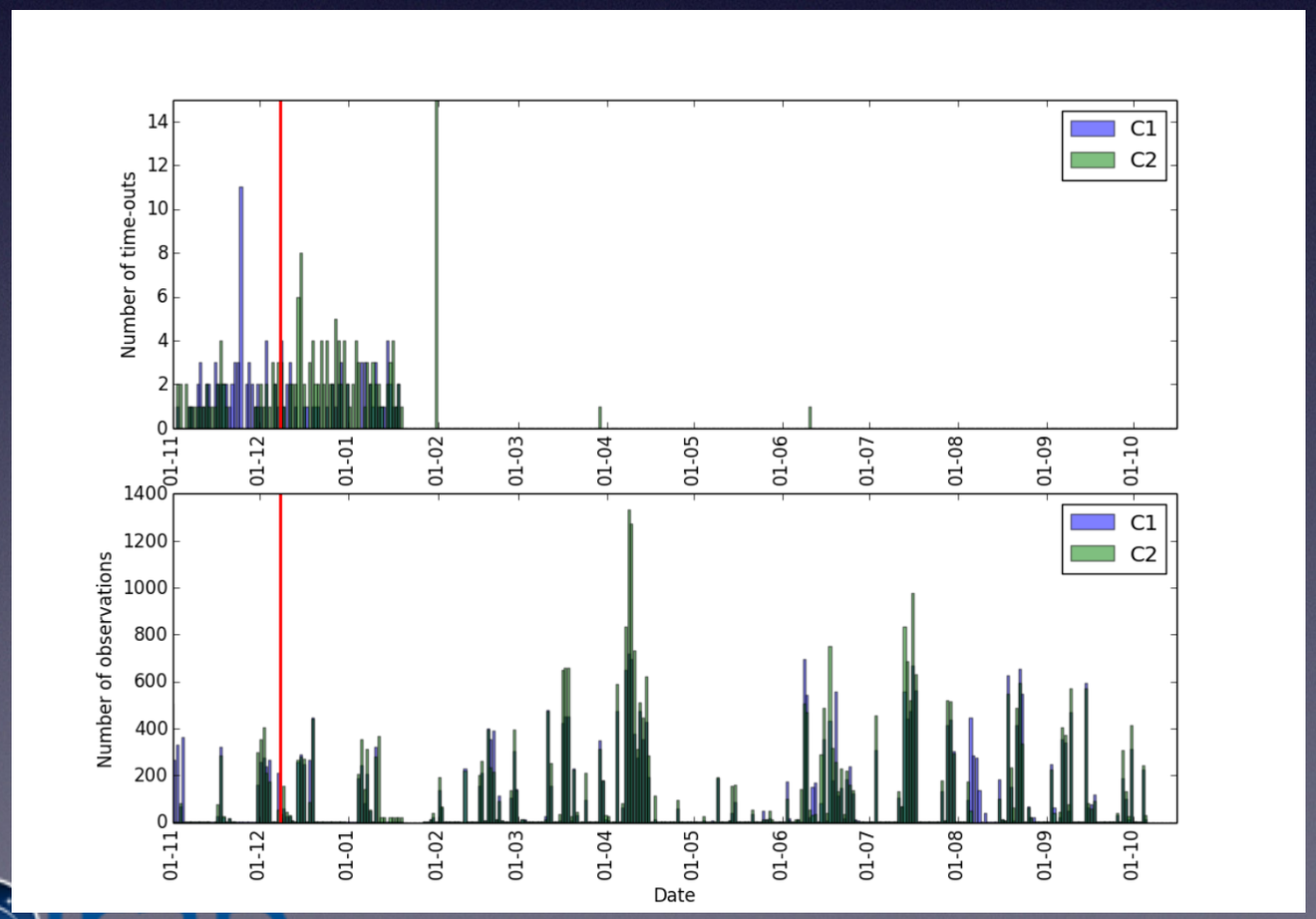
Objectif lens 40cm
largest coronagraph in the world !

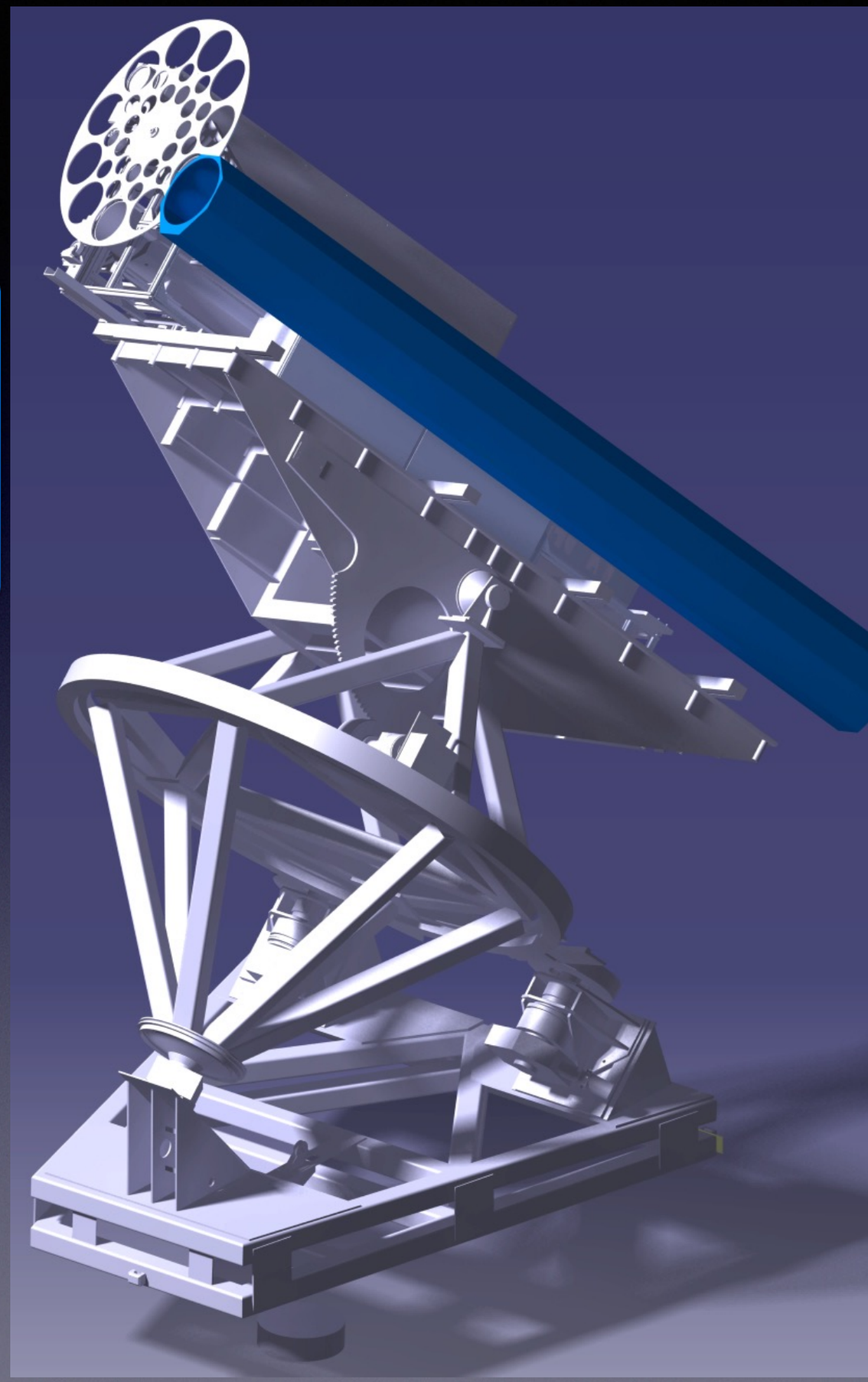
Name	Size(cm)	Place	Status
DKIST	400	Haleakala (Hawaii)	Commissioning
COSMO	100	?	Project
Sayan	53	Siberia	Closed
Caucase	53	Russia	Closed
Solar-C	50	Haleakala	Closed
Evans	40	Sacramento Peak	Closing
Mitaka	25	Japan	Closed
Lomnizcky Stit	22	Slovakia	Operational
CoMP	20	Mauna Loa	Operational
CLIMSO C1 & C2	20	Pic du Midi	Operational
K-Cor	20	Mauna Loa	Operational
Rozhen	15	Bulgaria	Operational
Proba 3	14	Space	Under Construction
Ondrejov	15 & 13	Czech Rep.	Closed
LASCO	4.7	Space	Operational
METIS Solar Orbiter	4	Space	Operational

2019 data

132 observing days
for FeXIII
over 335 available

180 observing days
for Hα in prominences
over 335 available





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7 Avril 2019
7:35 TU

Fe IX (174Å)
observé par le satellite
SWAP

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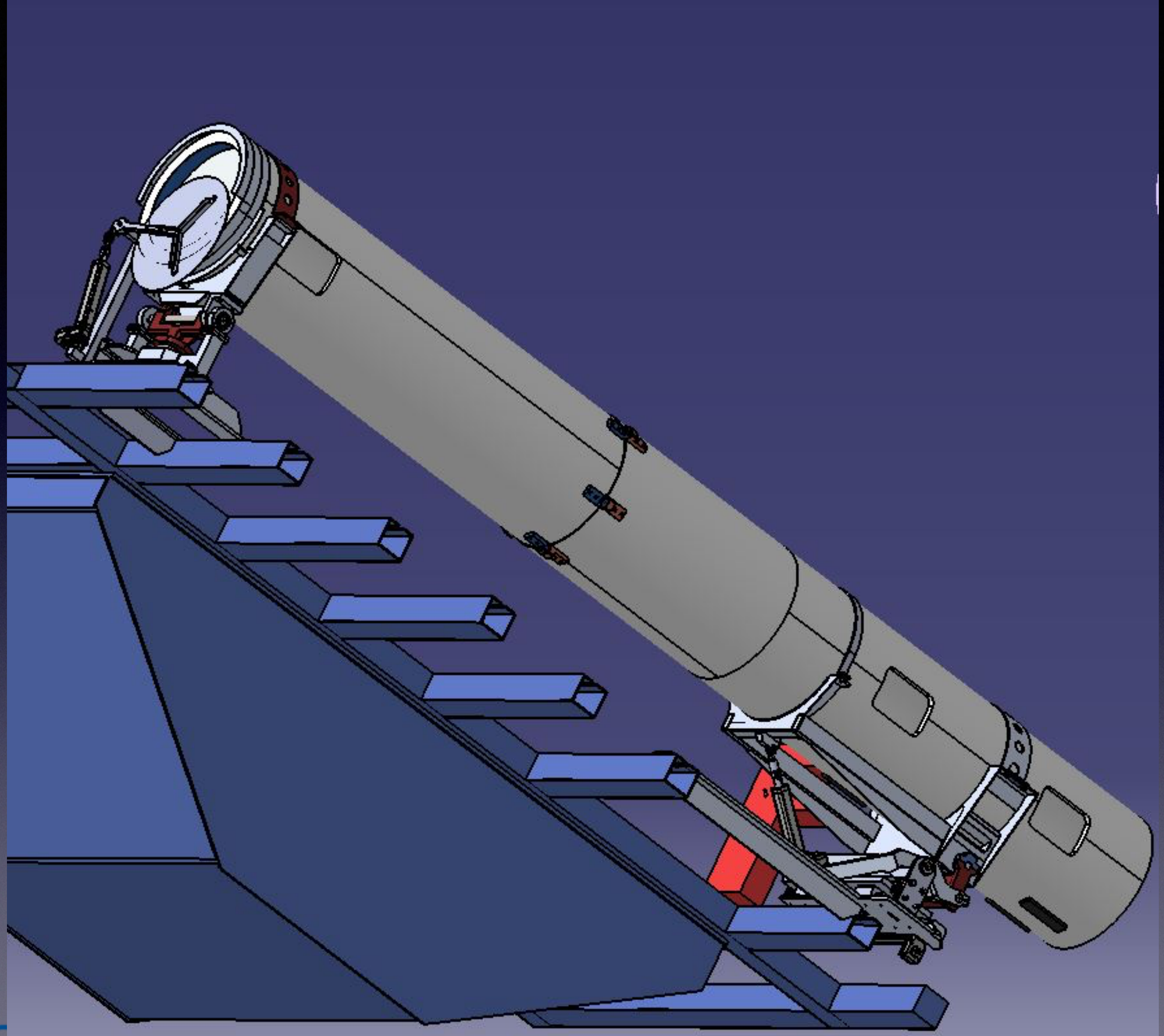

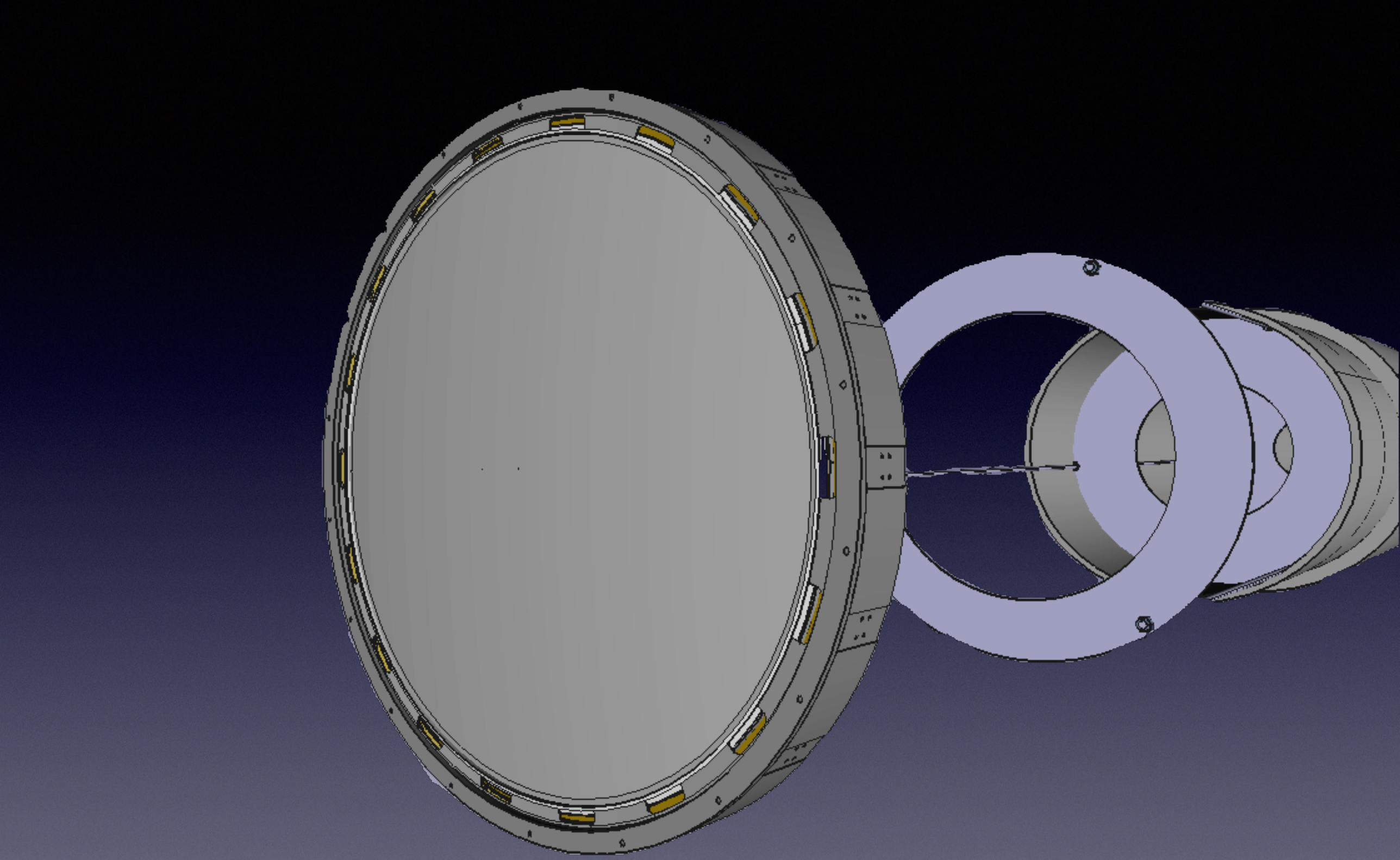

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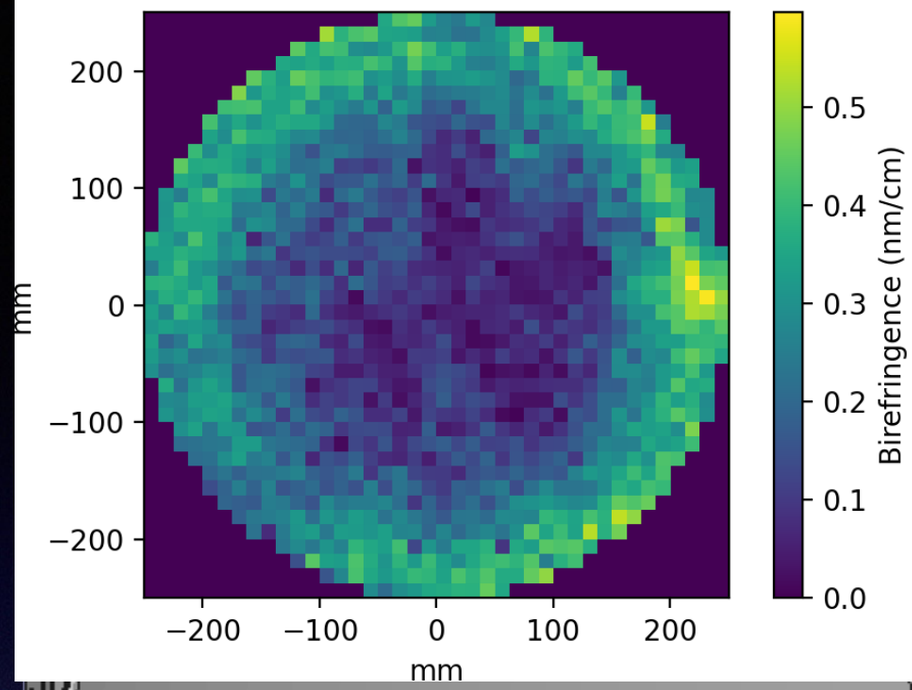

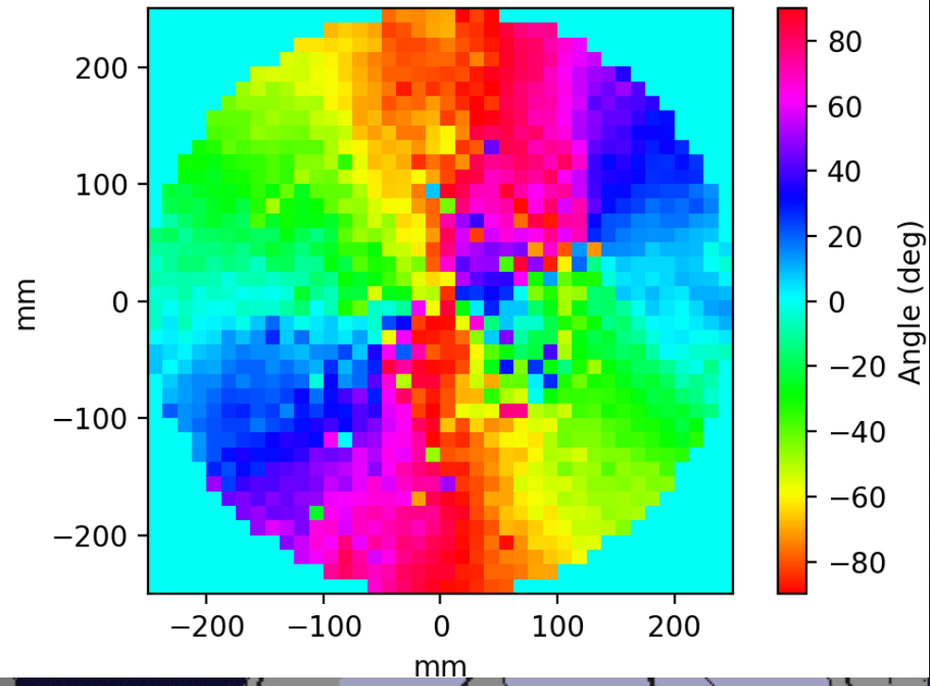

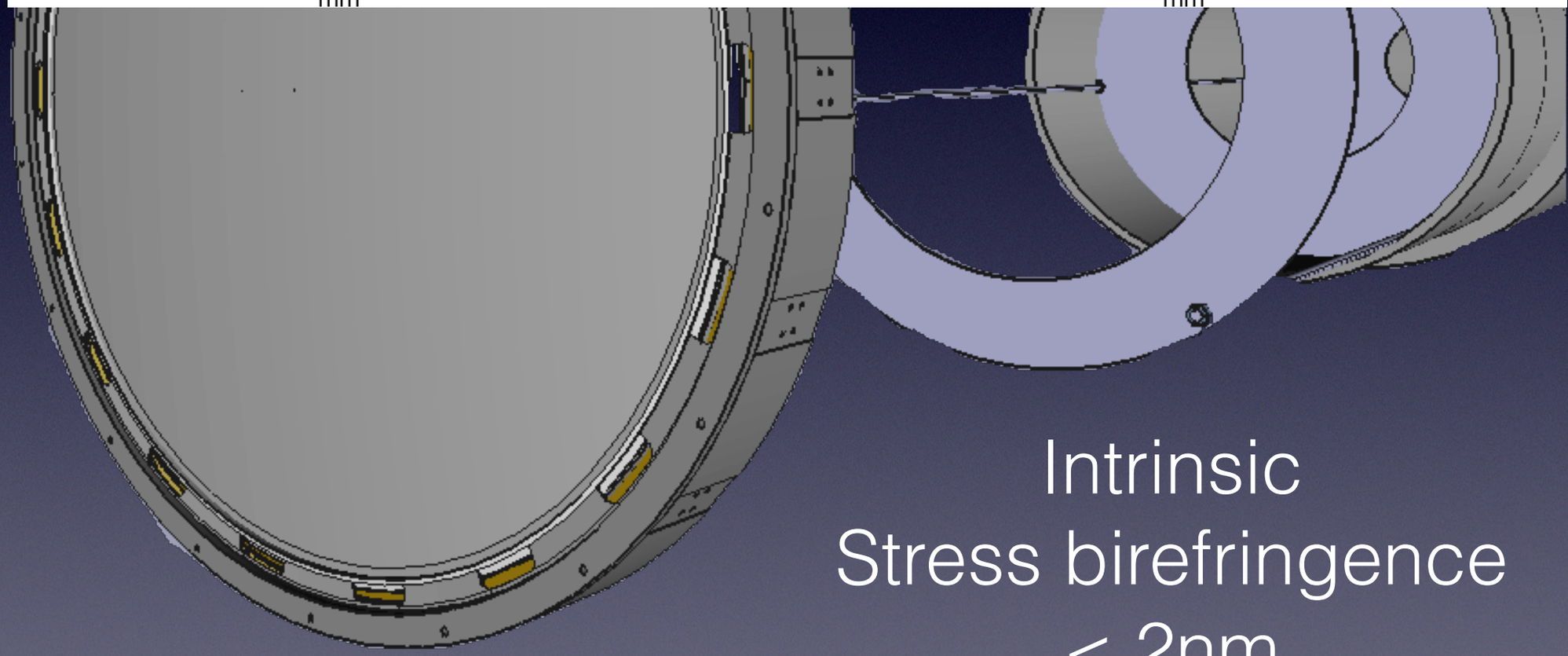

Intrinsic
Stress birefringence
< 2nm
0.03/λ

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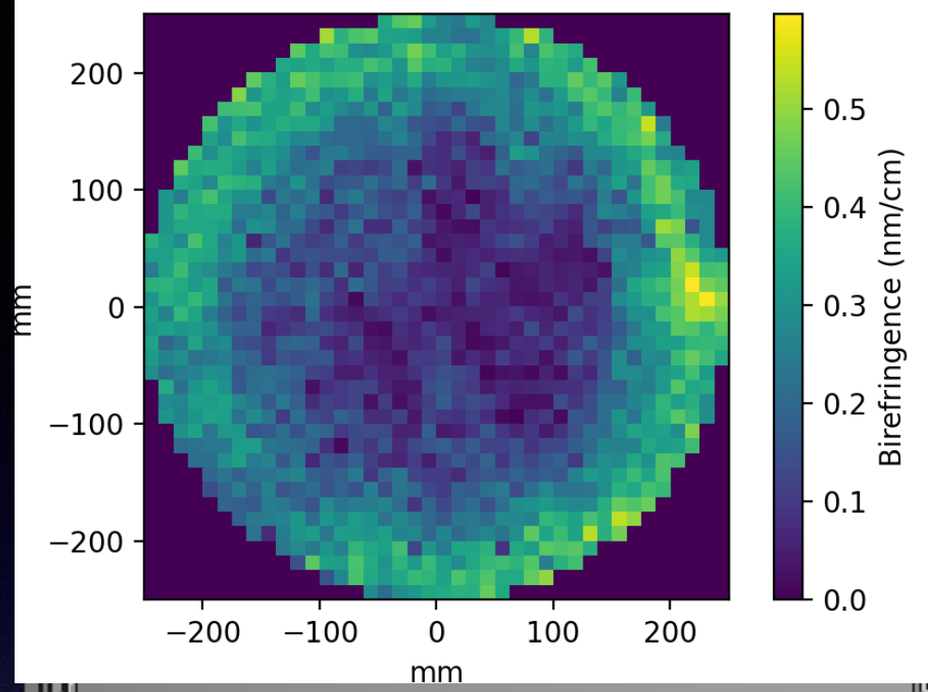
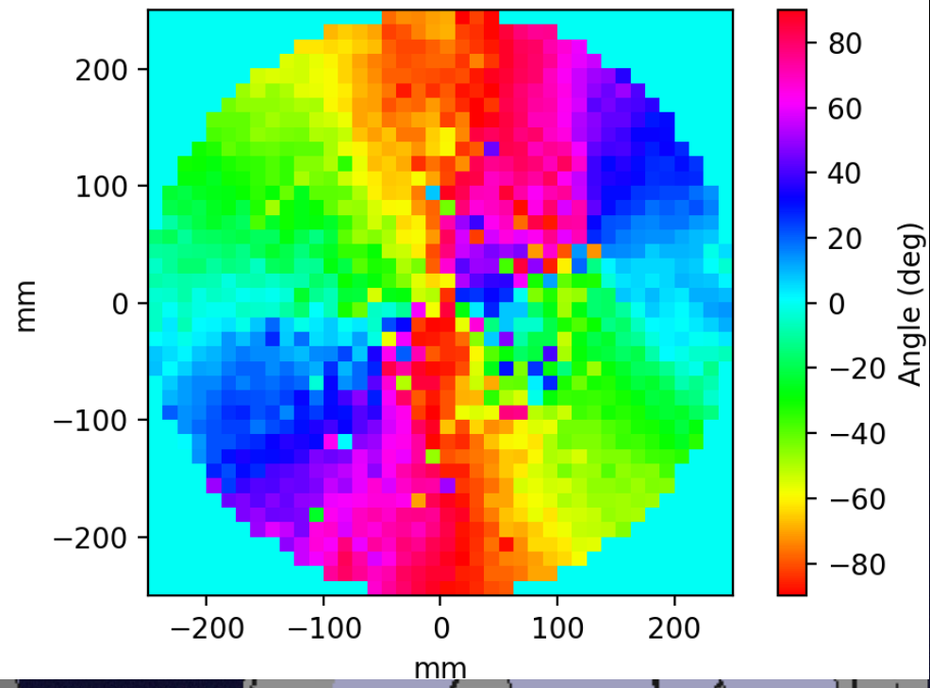
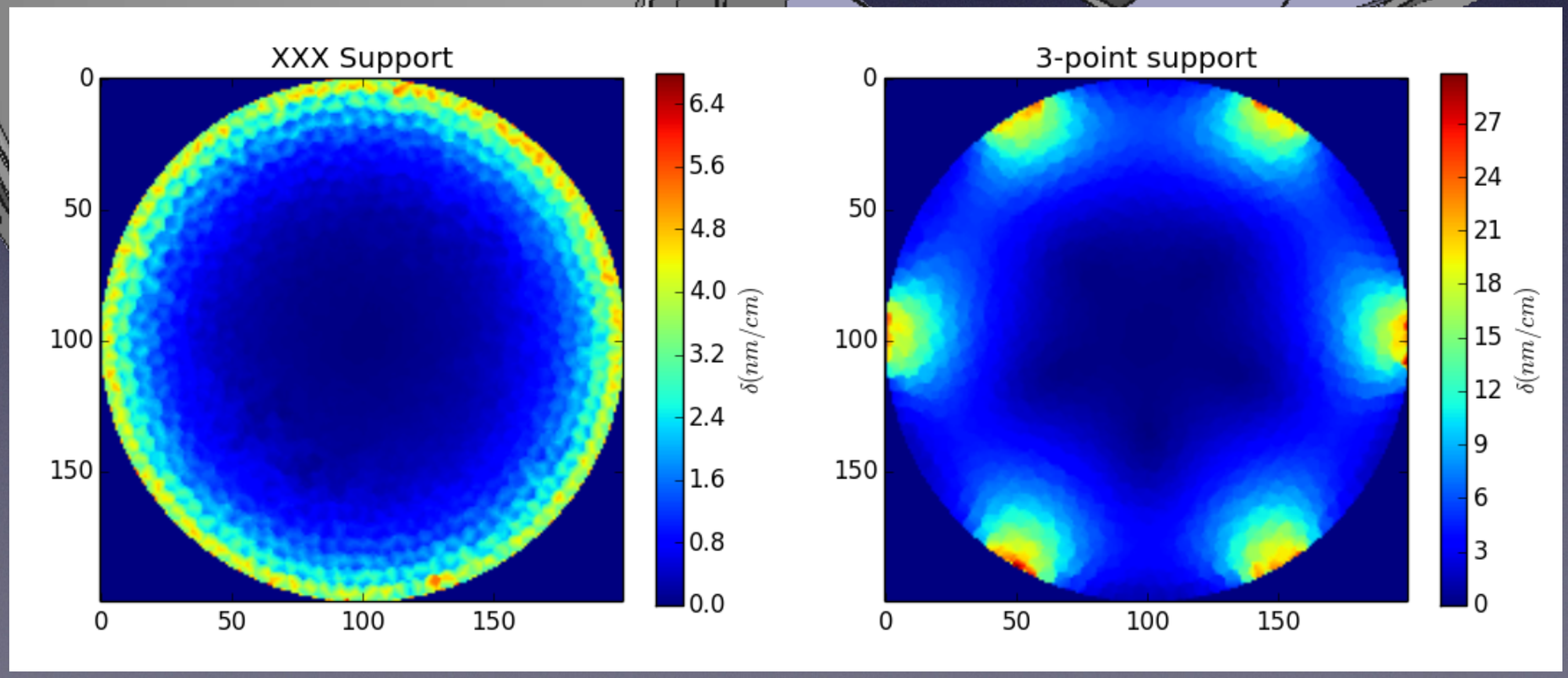




Forced birefringence < 2nm 0.03/λ



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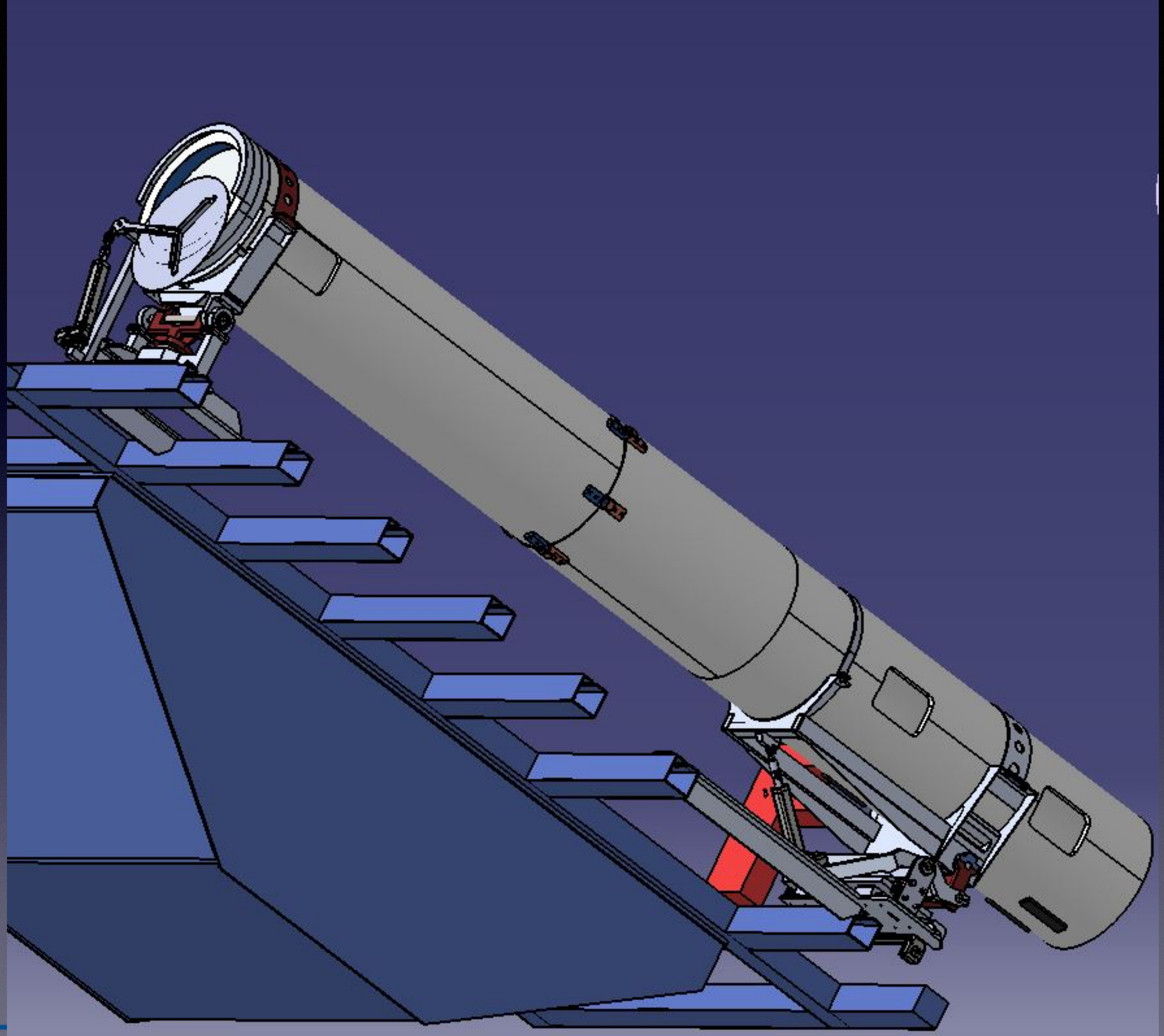

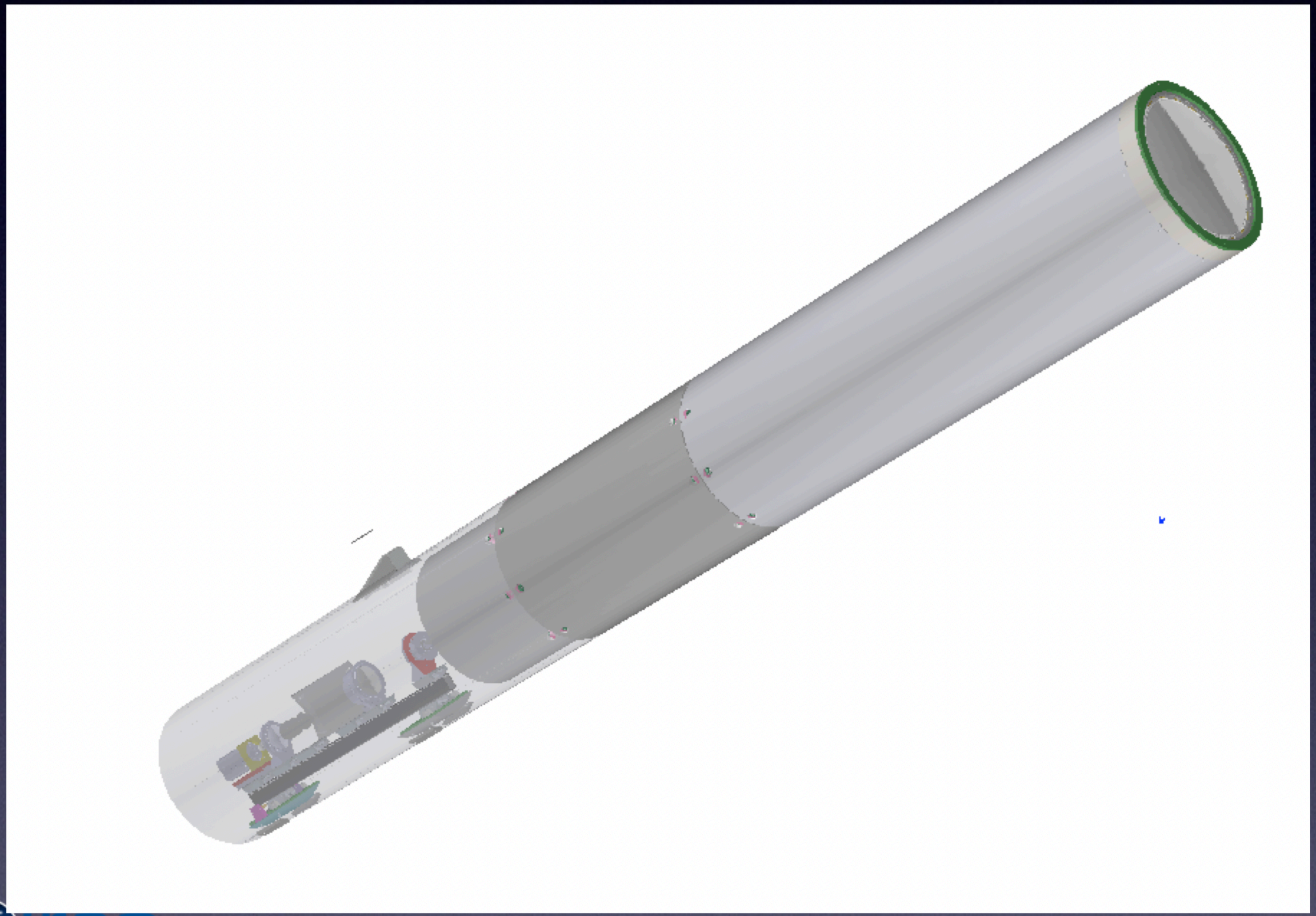

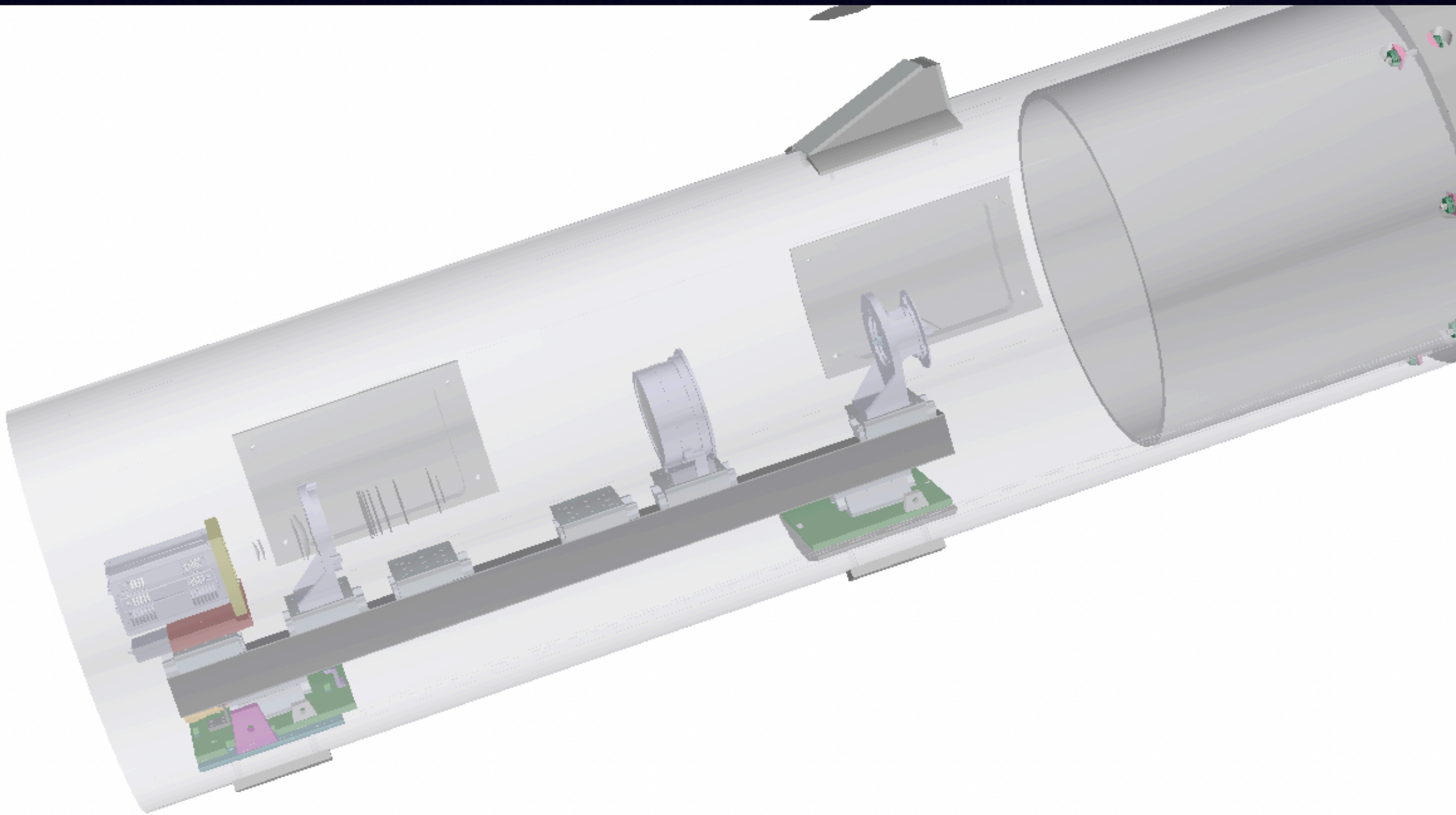

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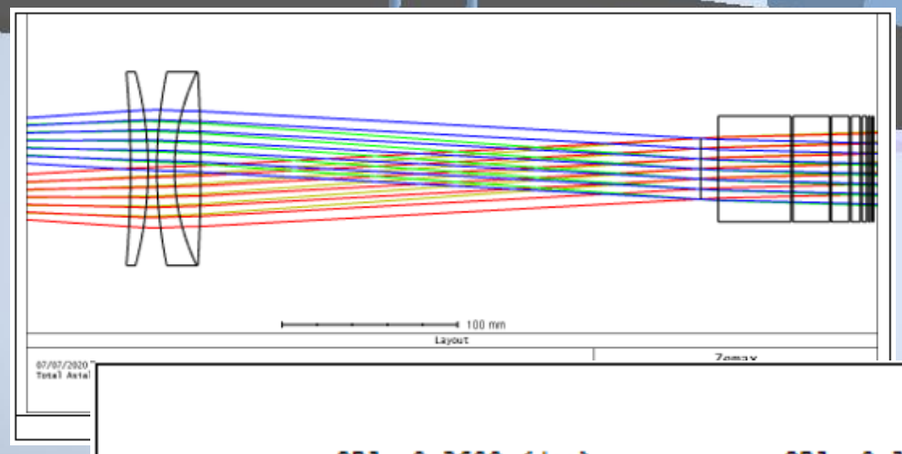

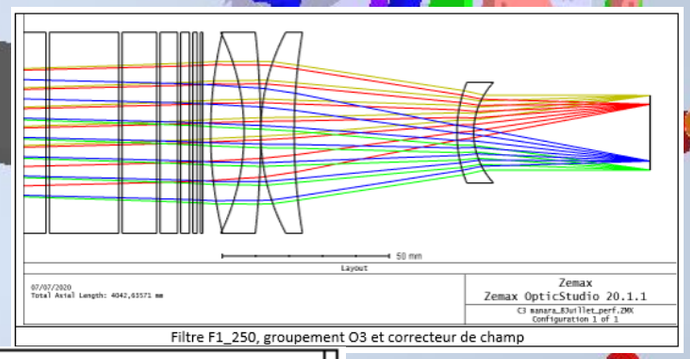

Filtre F1_250, groupement O3 et correcteur de champ

Building C3 in 2 phases

1st Phase: Telescope observing K-corona

2nd Phase: Lyot filter installed.

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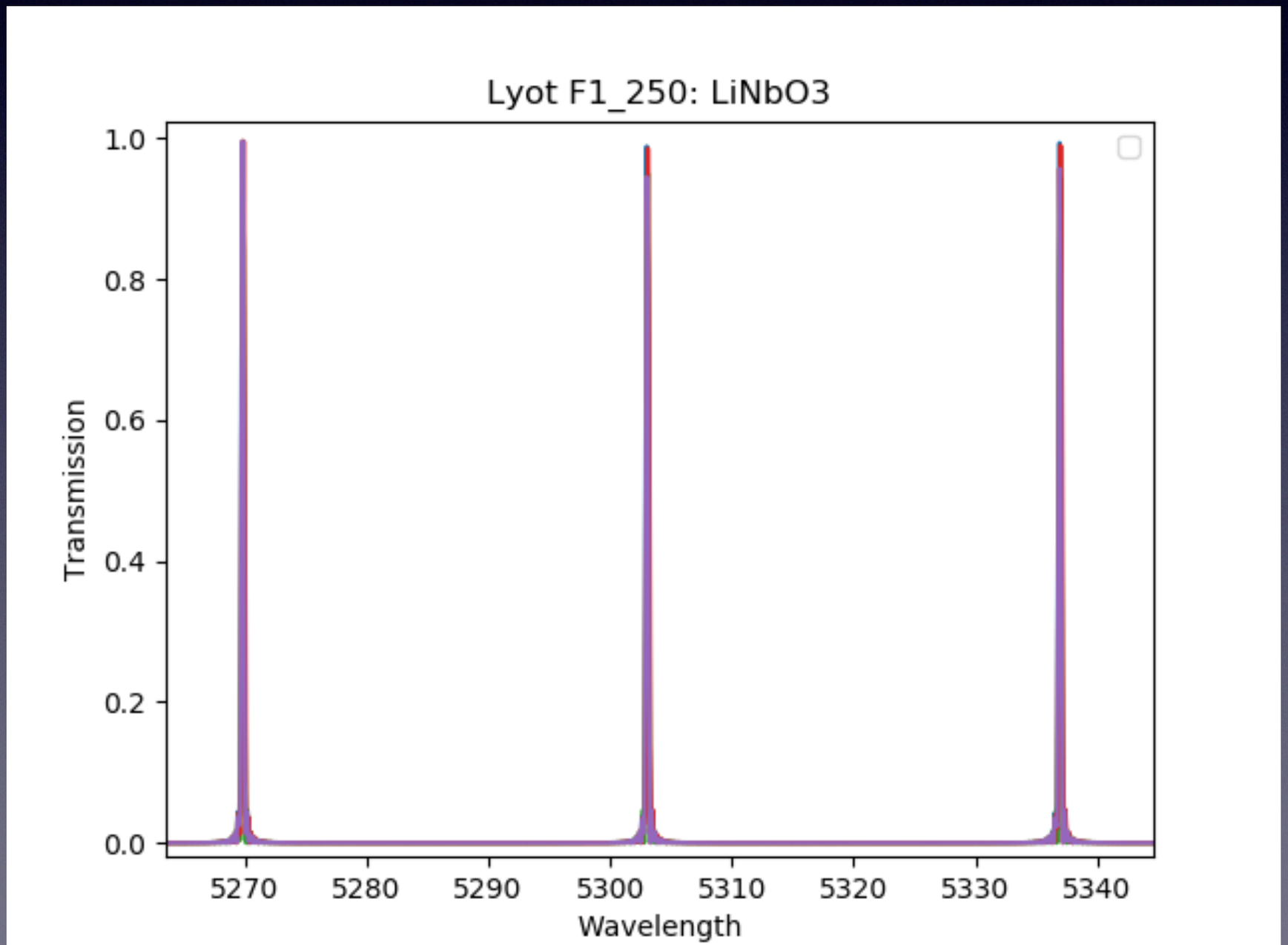
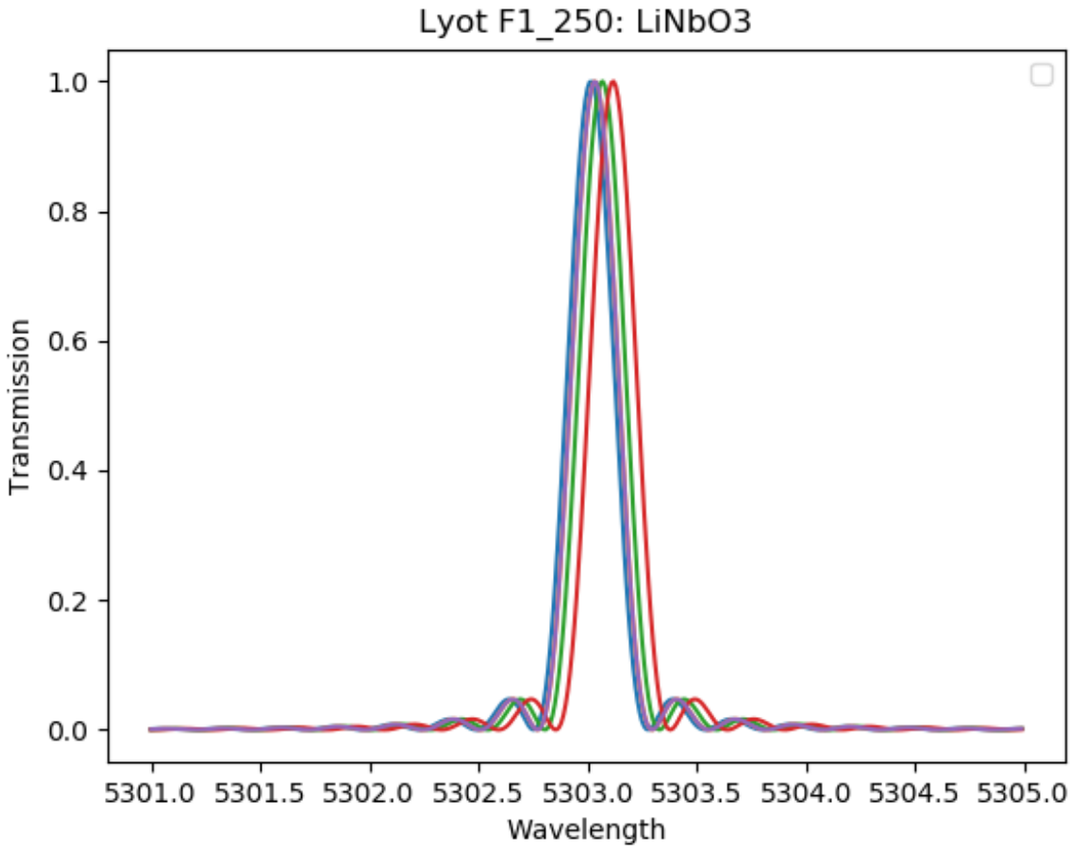
Lyot Filter

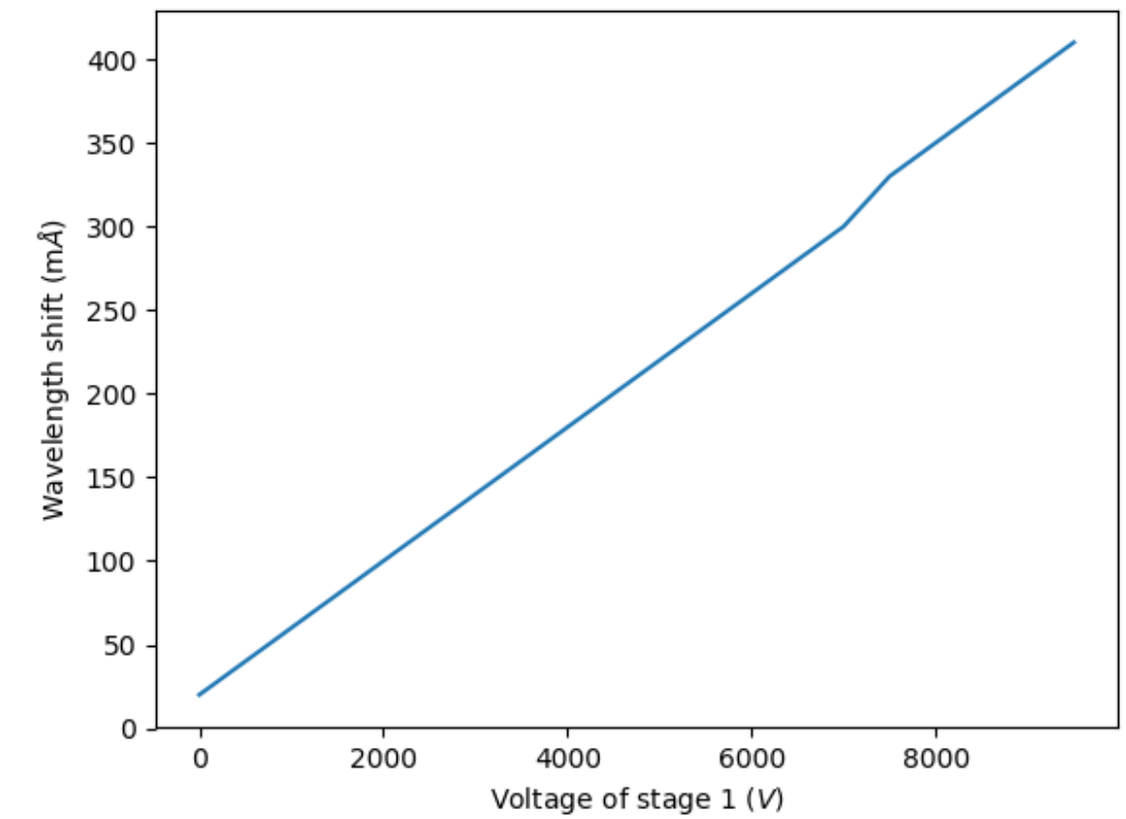
7 double Lyot stages in LiNbO3: 250 mA FWHM
83 mm plus polarisers and prefilter



Lyot filter

0.5A Tunability by applying electric fields on the 3 longest stages





Timeline Phase 1

	Status	Delivery
O1	Polishing	1st week of July
Carbon Tube	Painting	June 6th
Mechanics	Under construction	Last week of June
Detector	Under construction	Mid-June
Optical Support	Mechanisation	May thru June
O2-O3 Optics	**Call attending**	?

Tarbes: Mechanical tests	July
Tarbes: Optical Alignment	July - September
Transport to Pic du Midi	September - October
1st light Phase 1	October-December

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Funding

Observateurs Associés: 150 k€
(FIDUCIAL)

PNST: 4-8 k€ / year for science support

Projet CPER: 1.2 M€ (200 k€ for C3)

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The C3 team

Science: OMP - IRAP

Funding: Observateurs Associés - FIDUCIAL
Région CPER

Design and construction : OMP
Obs. Associés

Operation: Obs. Associés

Maintenance: OMP

Mise en valeur, vulgarisation: Régie du Pic du Midi?

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