Preparing a LOFAR proposal

Wilfred Frieswijk

Netherlands Institute for Radio Astronomy

- LOFAR Summary
  - …
- LOFAR proposals
  - Preparing for your own real data

LOFAR Summary

- **LOFAR is a very diverse instrument**
  - ✓ wide field of view

    >> degrees
  - ✓ extended baselines

    >1000 km; ~1”
  - ✓ broad spectral coverage

    up to 96MHz
  - ✓ spectral line capabilities
  - ✓ high time resolution

    ~ 5ms; down to 5ns
- **LOFAR data is difficult to handle…but not impossible!**

LOFAR Summary

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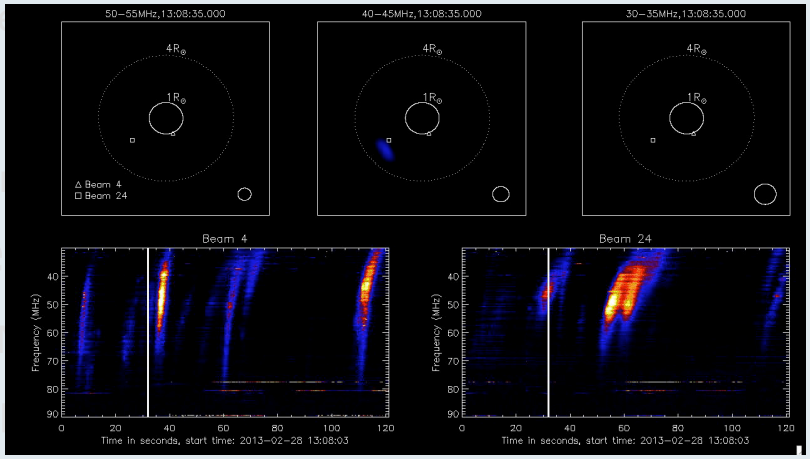
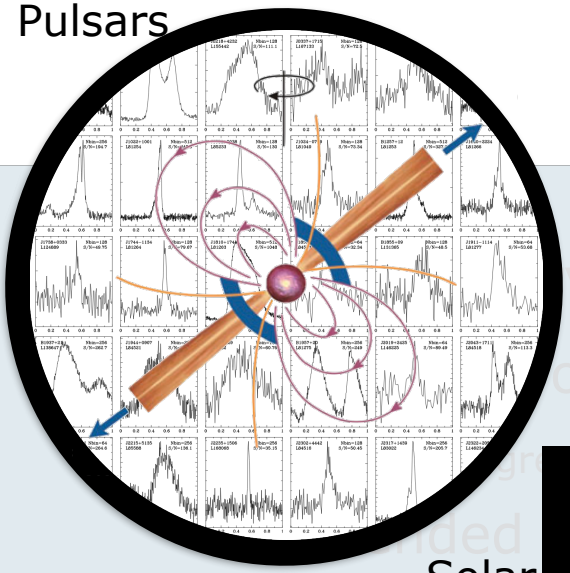
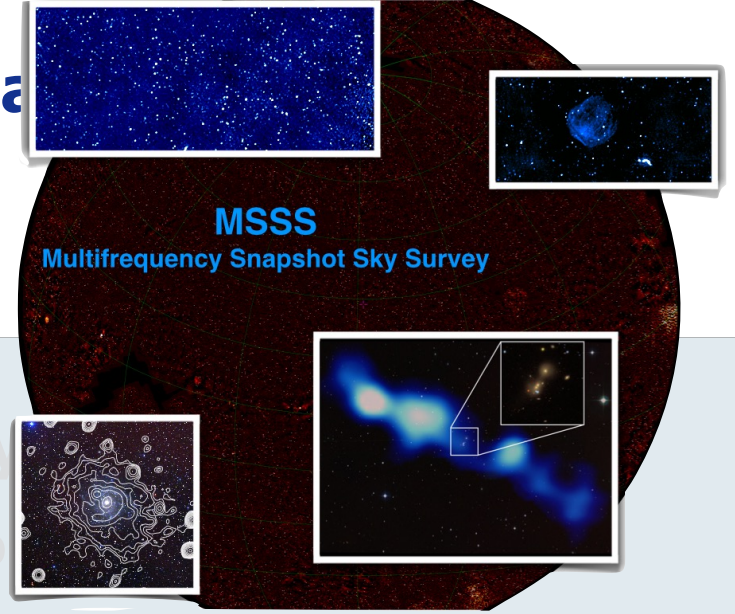
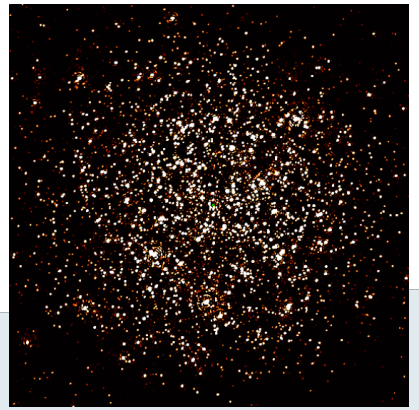


LOFAR Summa

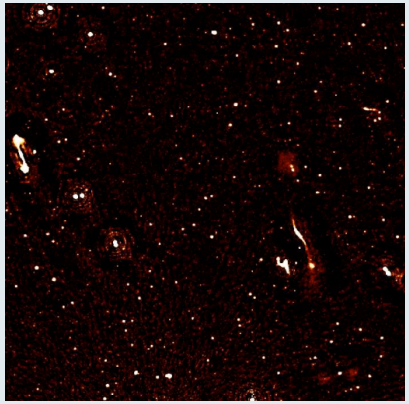
Pulsars



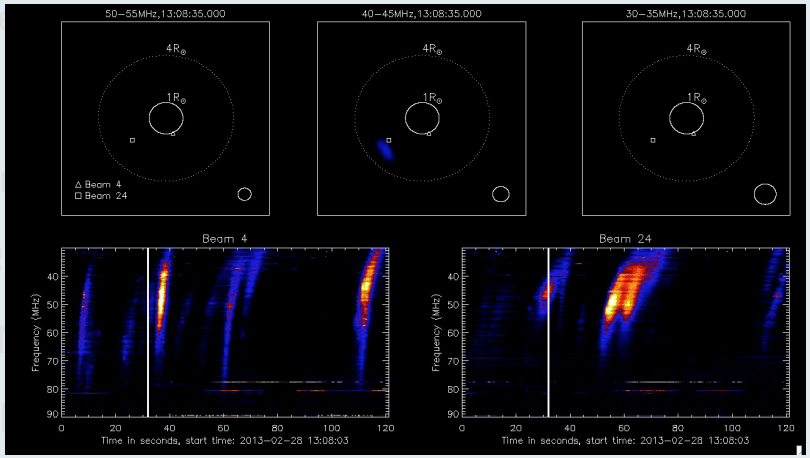


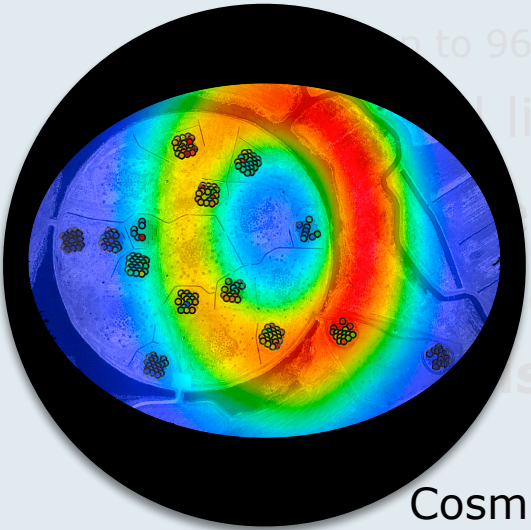


EoR

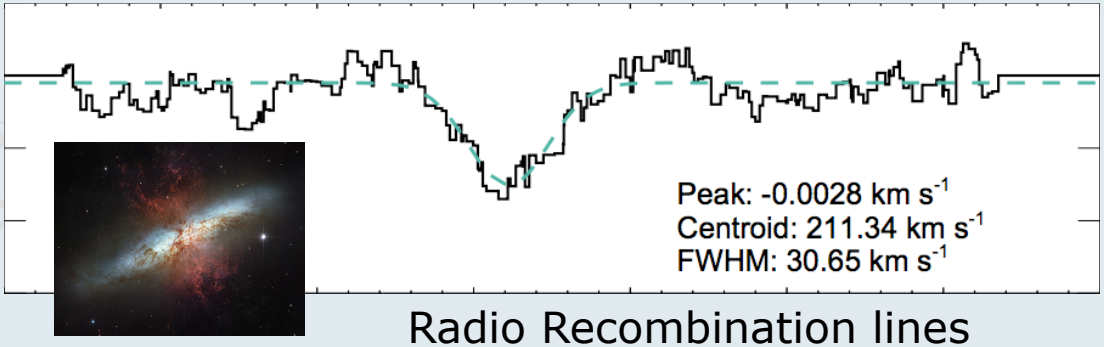


Solar





Cosmic Rays



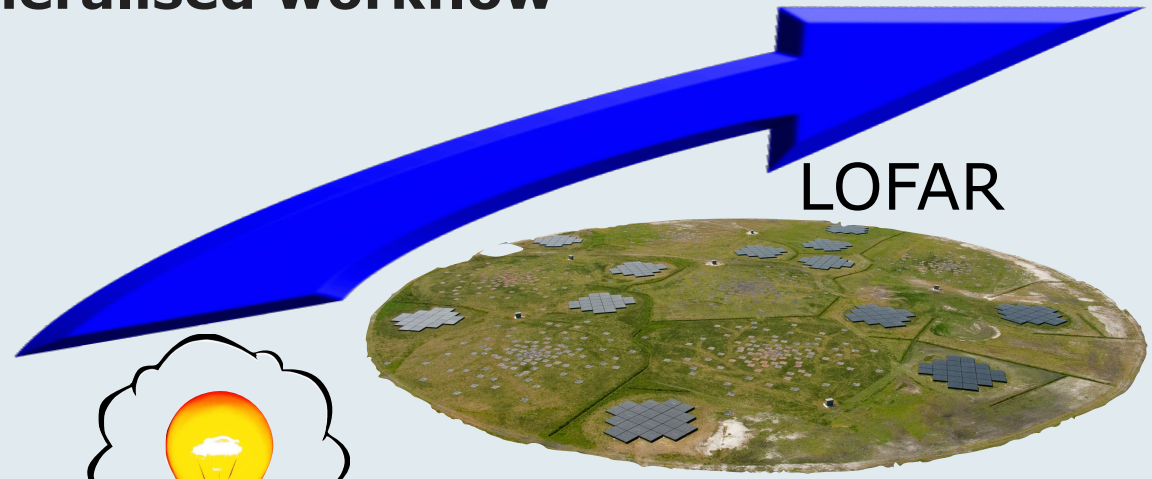
Radio Recombination lines

LOFAR proposals

- Generalised workflow

LOFAR proposals

- **Generalised workflow**



LOFAR

possibilities!

&

capabilities!

bright idea

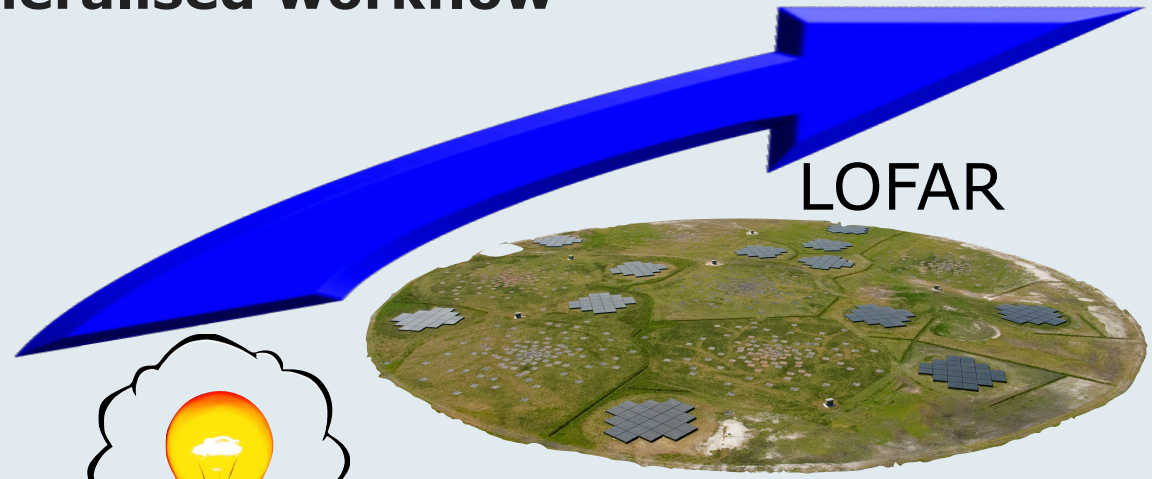
science case

&

technical case

LOFAR proposals

- **Generalised workflow**



LOFAR

bright idea

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science case

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LOFAR proposals

- Generalised workflow

possibilities!

&

apabilities!

science case

&

technical case

Roberto's talk: Interaction user - Radio Observatory

Roberto's talk: Interaction user - Radio Observatory

Roberto
Inte
C

LOFAR

ASTRON

CALL FOR PROPOSALS

International LOFAR Telescope

Proposal Call to the Worldwide Community

Cycle 3: 15 November 2014 - 14 May 2015

Submission deadline Wednesday 10 September 2014, at 12 UT

This file in PDF form

the online tool NorthStar

tion files adhere to the instructions given

proposal call info

bserving Cycles every year:

- May 15 – November 14
- November 15 – May 14

- Proposal call: 4 months before start of the Cycle (January, July)
- http://www.astron.nl/ra observatory/observing- proposals/regular-prop instructions/regular-p instr
- Proposal deadline: 2 before the start of t (March, September
- Advertisement of for the coming C
- Available observ processing hou

WORKING ON PROPOSAL: MUST SEE

ASTRON

capabilities

LOFAR

- LOFAR pages: http://www.astron.nl/radio-observatory/radio-observatory

AL INFORMATION

WORKING ON PROPOSAL: MUST SEE

ASTRON

strategies

LOFAR

- Interferometric mode web page (mode fully supported):
- http://www.astron.nl/r array-configurations
- Observing strategies (L
- Imaging Pipeline -> se
- Characterization: achi strategies

ters-and-

AL: OBSERVING STRATEGIES

ASTRON

WORKING ON PROPOSAL: MUST SEE

ASTRON

tools

LOFAR

- Note LOFAR Tools

LOFAR Image noise calculator

Observation details

CALCULATE

ASTRON

Lofar data size Calculator

UV Data:

ASTRON

Netherlands Institute for Radio Astronomy

RADIO OBSERVATORY

LOFAR

LOFAR TOOLS

Northstar Proposal Tool

LOFAR Management of Measurements (MoM)

LOFAR Long-Term Archive (LTA)

LOFAR Long-Term Archive (LTA) - HOW TO

LOFAR Data Size Calculator

LOFAR Image Noise Calculator

Installing the LOFAR Software Stack

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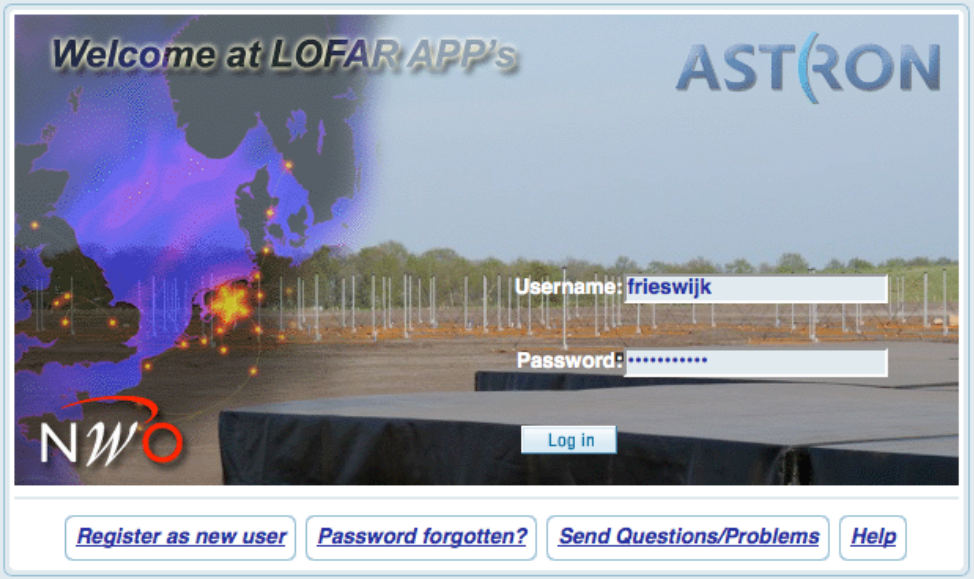
login

- **Web-based tool**
- **Developed ~10 years ago**
- **Used by various telescopes**
  - ✓ WSRT, LOFAR
  - ✓ EVN, JCMT, eMerlin…
- **Account**
  - ✓ MoM, LTA
- **Walkthrough available**

lofar.astron.nl/proposal



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proposal list

Show reviewed proposals : ○ Yes ◉ No

Proj_ID	PI	Title	Community	Category	Status	Options
			LOFAR telescope Proposals			
	Frieswijk	Test Jan 21 2014	LOFAR community	regular	in preparation	Edit Copy Delete Submit View
	Frieswijk	fcs	LOFAR community	regular	in preparation	Edit Copy Delete Submit View
	Frieswijk	Test 2014-01-08	LOFAR community	regular	in preparation	Edit Copy Delete Submit View
	Frieswijk		LOFAR community	regular	in preparation	Edit Delete Submit View
	Oonk	Copy of LOFAR Galactic Radi...	LOFAR community	regular	in preparation	Edit View
LRA12A001	Frieswijk	Just a test from science su...	LOFAR community	reserved_access	in preparation	Edit Delete Submit View

Create new proposal

Prepare proposal

facility : **LOFAR telescope**
Community : **LOFAR community**
Choose category : **regular** *
Choose period : **II** *

Deadline: 27 June 2014 00:00:00 UTC

OK Cancel

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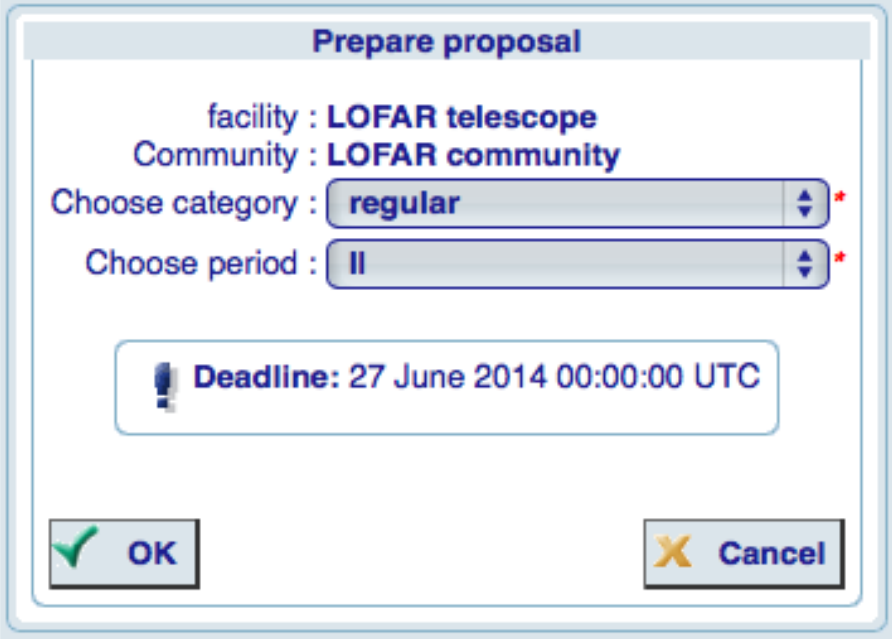
start a new proposal



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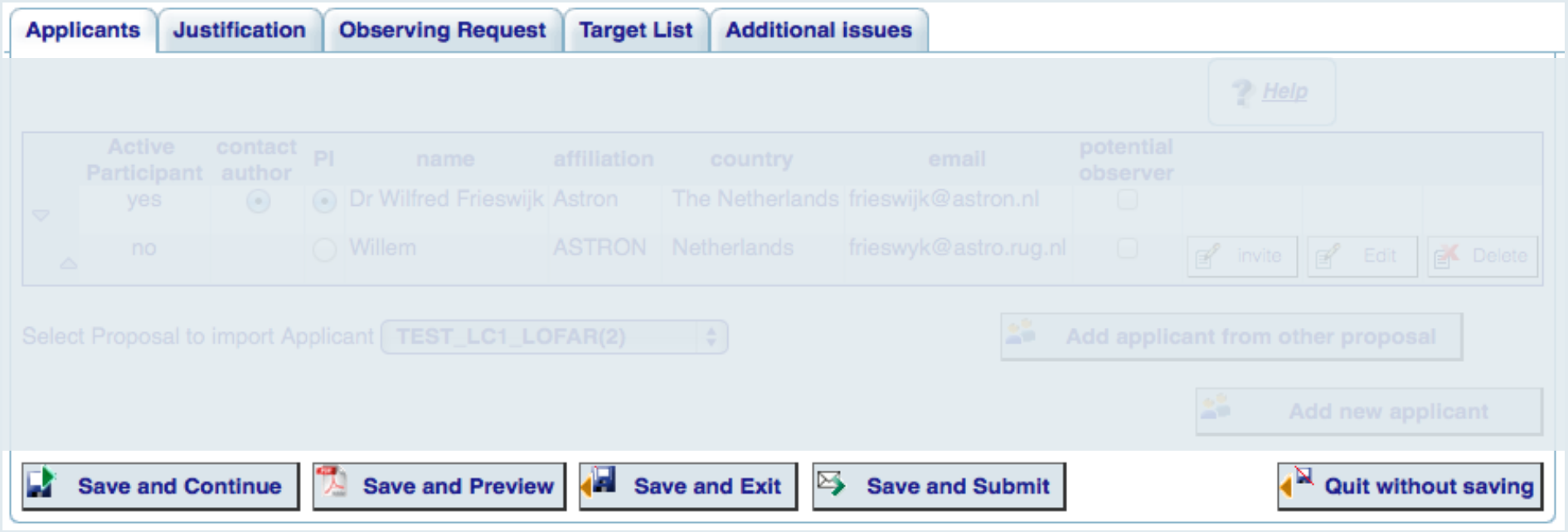
applicants

- manual
- from previous proposal



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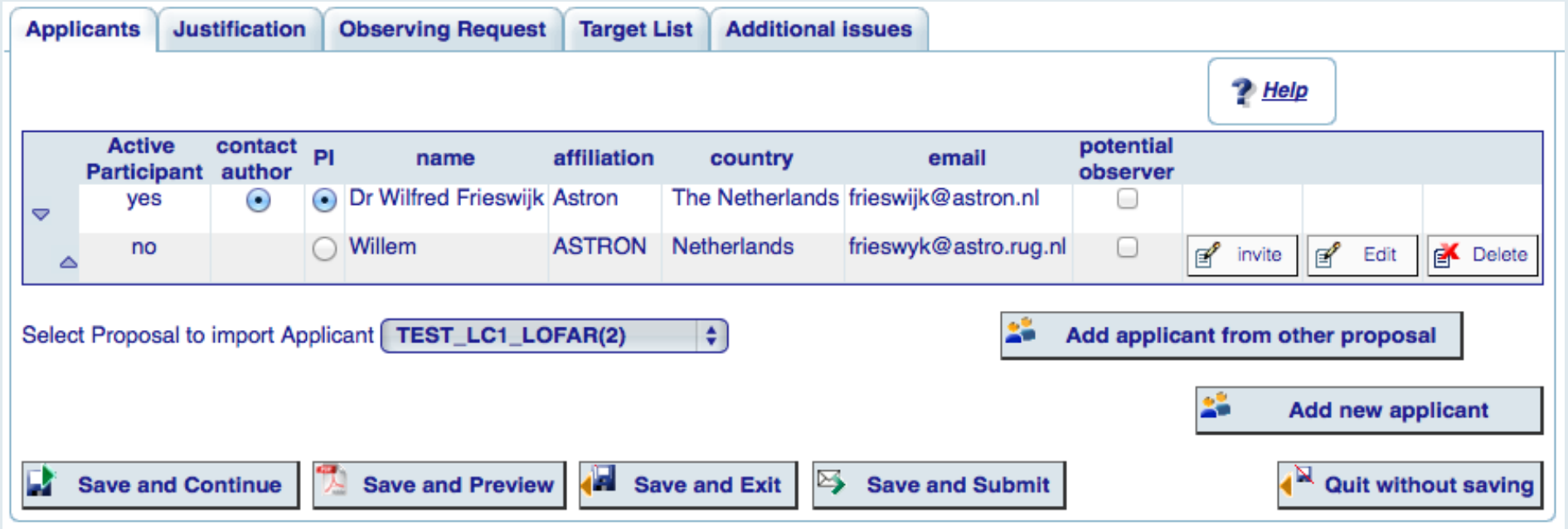

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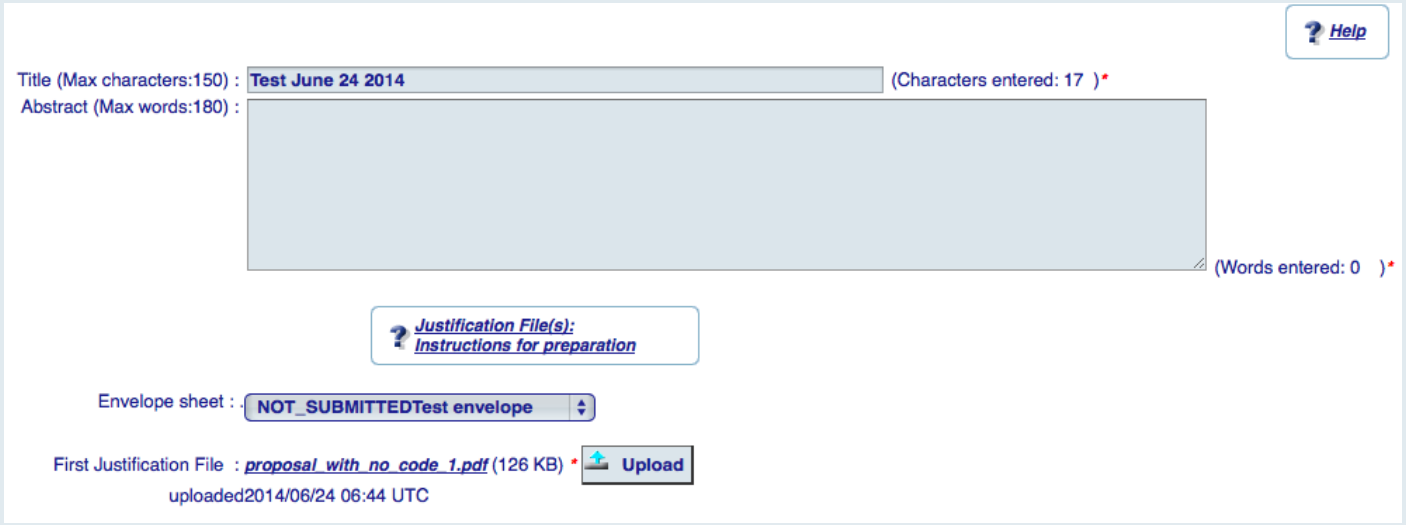
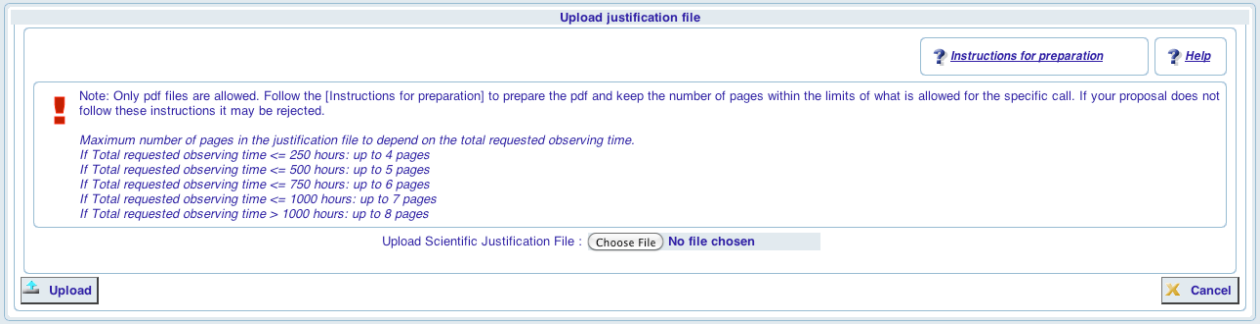
justification

Applicants | Justification | Observing Request | target list | Additional issues

- **Justification, envelope sheet**
  - ✓ note file restrictions





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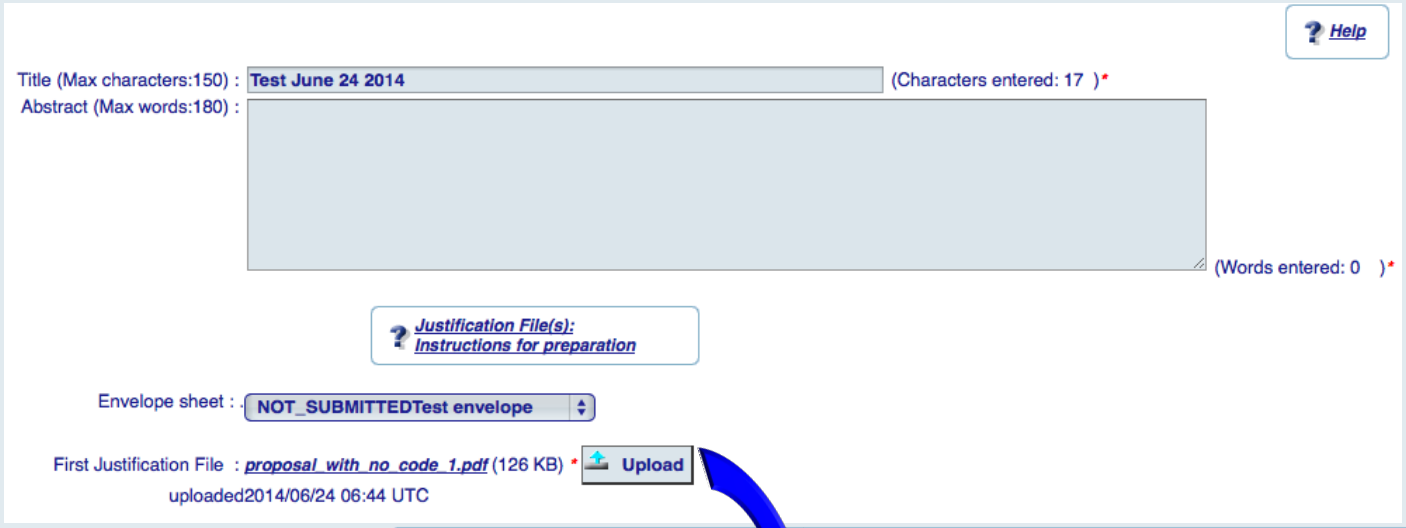

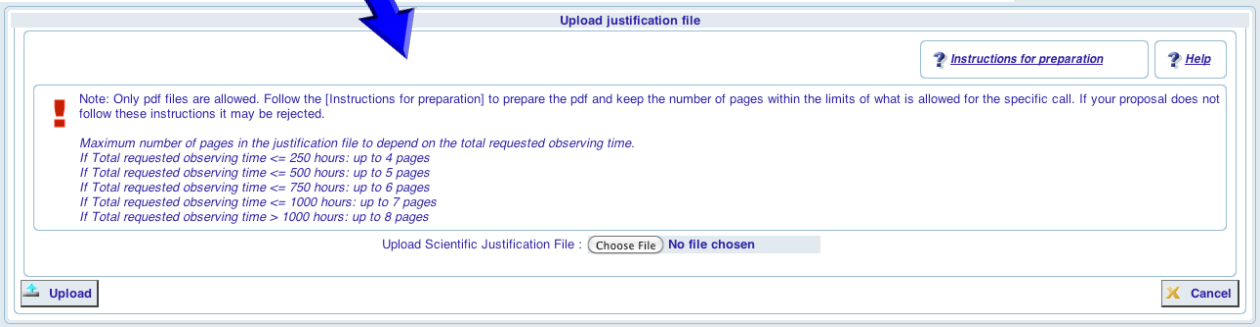

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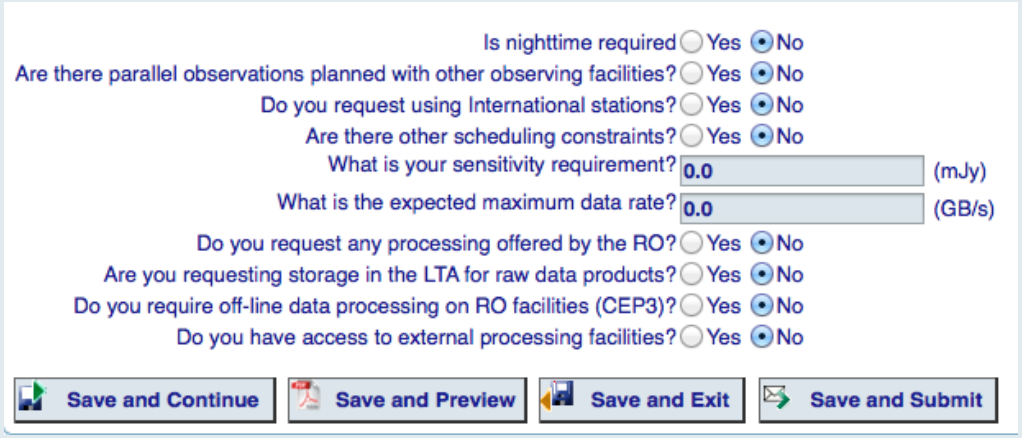
justification

- **Technical justification**



Is nighttime required (•) Yes ( ) No

Elaborate (Max words:60) :

nighttime requirement

(Words entered: 0)*

Are there parallel observations planned with other observing facilities? (•) Yes ( ) No

Elaborate

parallel observations

(Words entered: 0)*

Do you request using International stations? (•) Yes ( ) No

Are they essential/critical for the observations? (•) Yes ( ) No

Elaborate

international stations

(Words entered: 0)*

Are there other scheduling constraints? (•) Yes ( ) No

Elaborate

Explain why the International stations are essential for the science proposed.

other constraints

(Words entered: 0)*

What is your sensitivity requirement? 10.0 (mJy)

What is the expected maximum data rate? 10.0 (GB/s)

sensitivity & data rate

Do you request any processing offered by the RO? (•) Yes ( ) No

Do you request the "default" imaging pipeline offered by the RO? ( ) Yes (•) No

RO pipelines/imaging

Are you requesting storage in the LTA for raw data products? (•) Yes ( ) No

Elaborate

raw data to LTA

(Words entered: 0)*

Do you require off-line data processing on RO facilities (CEP3)? (•) Yes ( ) No

Elaborate

off-line processing (CEP3)

(Words entered: 0)*

Do you have access to external processing facilities? (•) Yes ( ) No

Elaborate

external processing

(Words entered: 0)*

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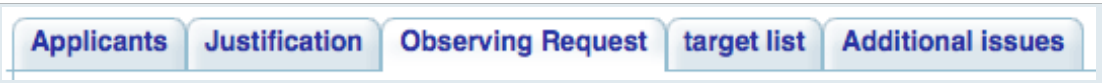
instrument specifications



- 2 step process

Id	Targets	Runs	Telescope	Mode	Exposure (Hours)	BF Data (TB)	Store Raw Data	UV Data (TB)	Store UV Data	TBB Data (TB)	Total LTA Storage (TB)	
A	0 targets	0 runs	LOFAR		0	0.0	NO	0.0	NO	0.0	0.0	Edit Copy Delete

Specify a new observation

step 1a

Id	Targets	Telescope	Mode	av time	av freq	demixing	Total LTA Storage (TB)	P/O Ratio	Total Processing Time (Hours)	
A	0 targets	LOFAR	Pre processing only			N	0.00			Edit Copy Delete

Specify a new Pipeline :

step 1b

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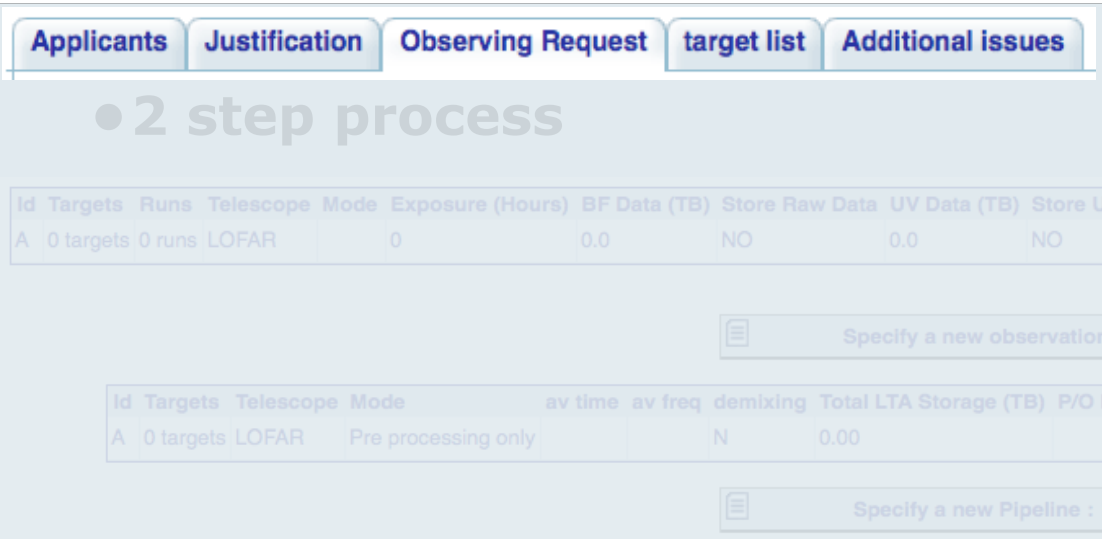
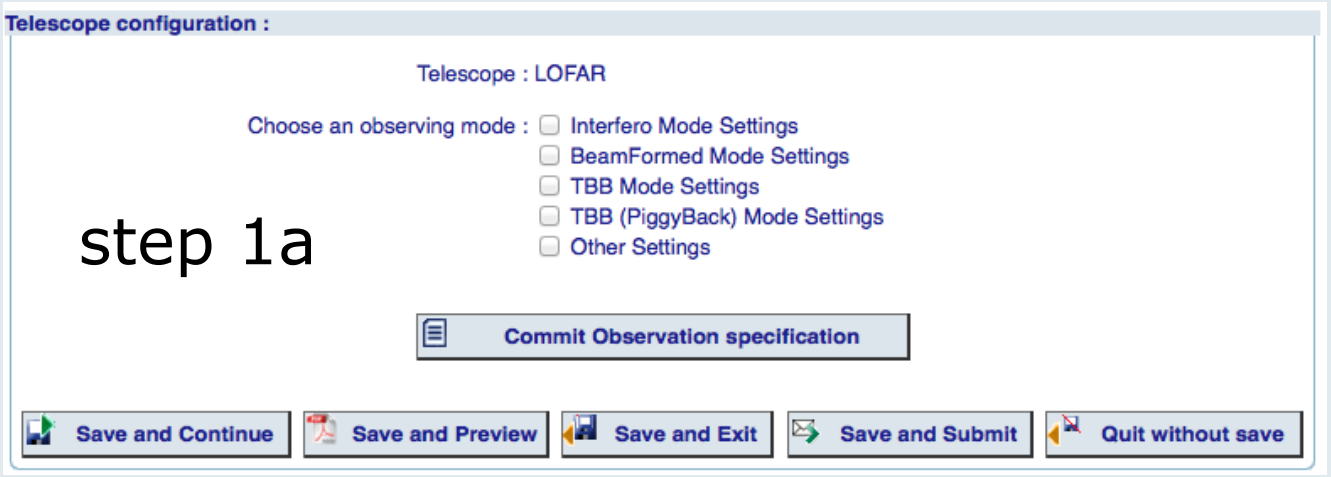
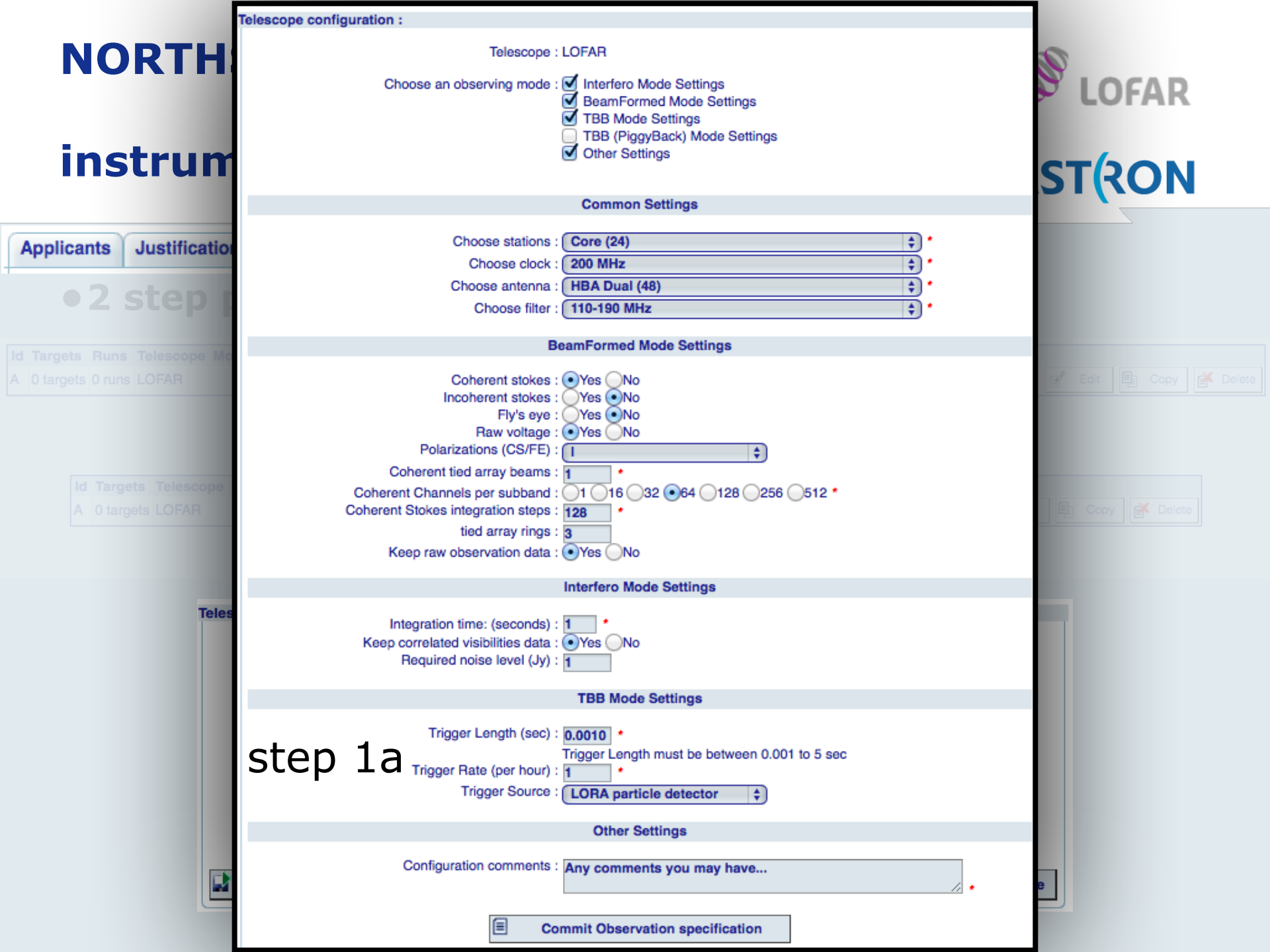
instrument specifications






Telescope configuration :
Telescope : LOFAR
Choose an observing mode :
Interfero Mode Settings
BeamFormed Mode Settings
TBB Mode Settings
TBB (PiggyBack) Mode Settings
Other Settings
Common Settings
Choose stations : Core (24)
Choose clock : 200 MHz
Choose antenna : HBA Dual (48)
Choose filter : 110-190 MHz
BeamFormed Mode Settings
Coherent stokes : Yes No
Incoherent stokes : Yes No
Fly's eye : Yes No
Raw voltage : Yes No
Polarizations (CS/FE) : I
Coherent tied array beams : 1
Coherent Channels per subband : 1 16 32 64 128 256 512
Coherent Stokes integration steps : 128
tied array rings : 3
Keep raw observation data : Yes No
Interfero Mode Settings
Integration time: (seconds) : 1
Keep correlated visibilities data : Yes No
Required noise level (Jy) : 1
TBB Mode Settings
Trigger Length (sec) : 0.0010
Trigger Length must be between 0.001 to 5 sec
Trigger Rate (per hour) : 1
Trigger Source : LORA particle detector
Other Settings
Configuration comments : Any comments you may have...
Commit Observation specification
step 1a

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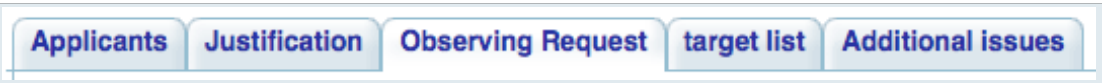
instrument specifications



- 2 step process

Id	Targets	Runs	Telescope	Mode	Exposure (Hours)	BF Data (TB)	Store Raw Data	UV Data (TB)	Store UV Data	TBB Data (TB)	Total LTA Storage (TB)	
A	0 targets	0 runs	LOFAR		0	0.0	NO	0.0	NO	0.0	0.0	Edit Copy Delete

Specify a new observation

step 1a

Id	Targets	Telescope	Mode	av time	av freq	demixing	Total LTA Storage (TB)	P/O Ratio	Total Processing Time (Hours)	
A	0 targets	LOFAR	Pre processing only			N	0.00			Edit Copy Delete

Specify a new Pipeline :

step 1b

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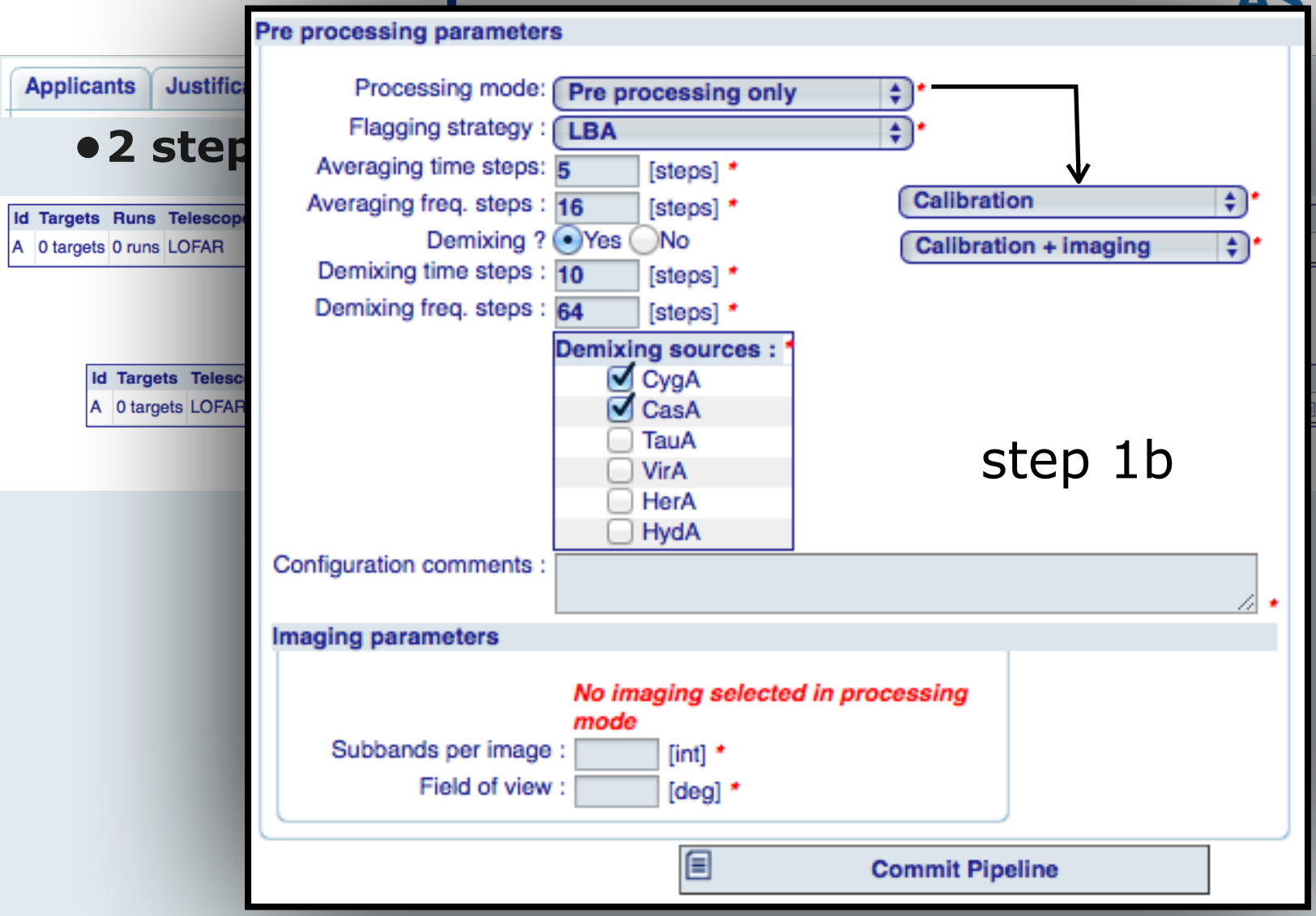
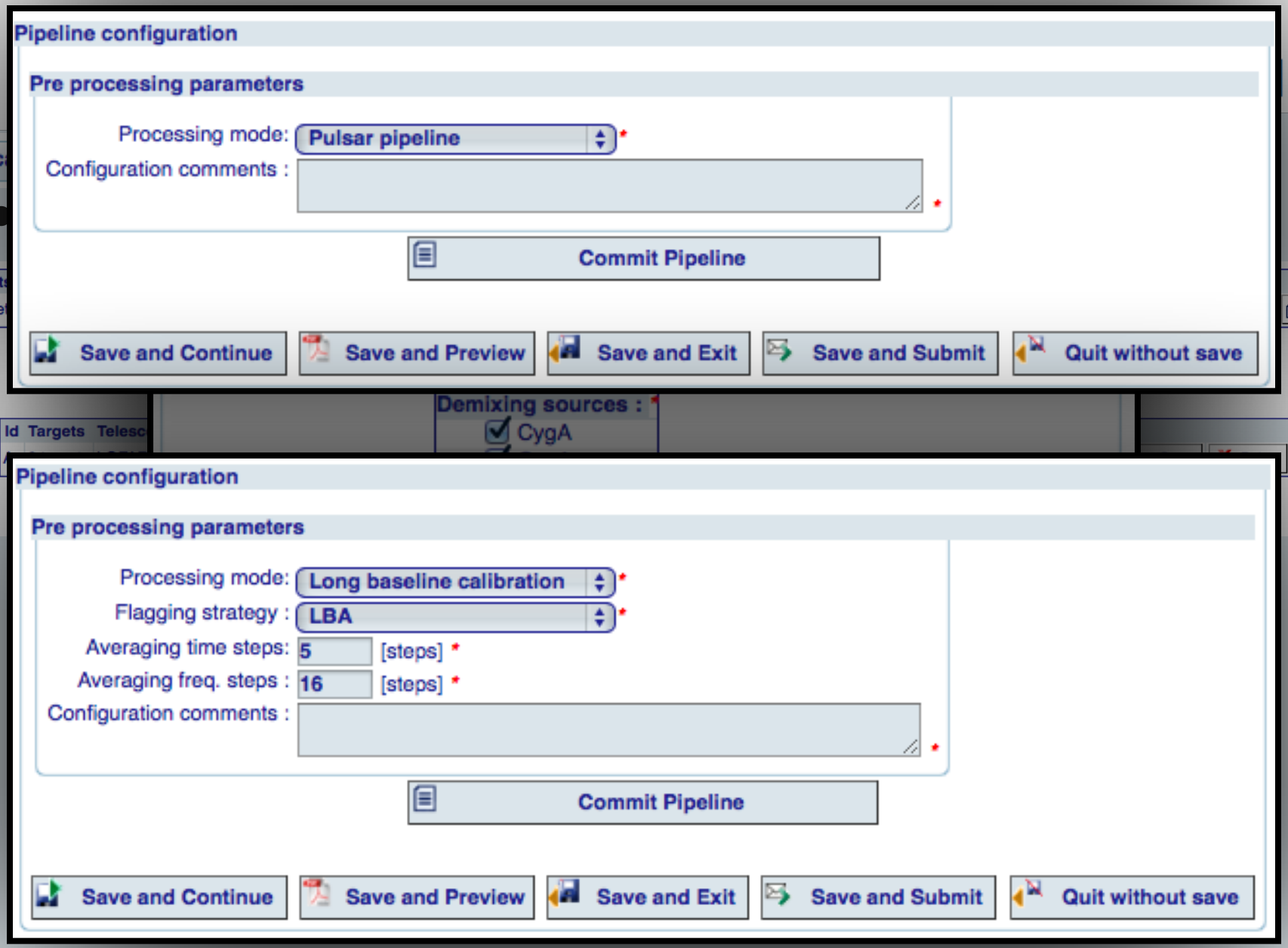
instrument specifications



- 2 step

NORTHSTAR

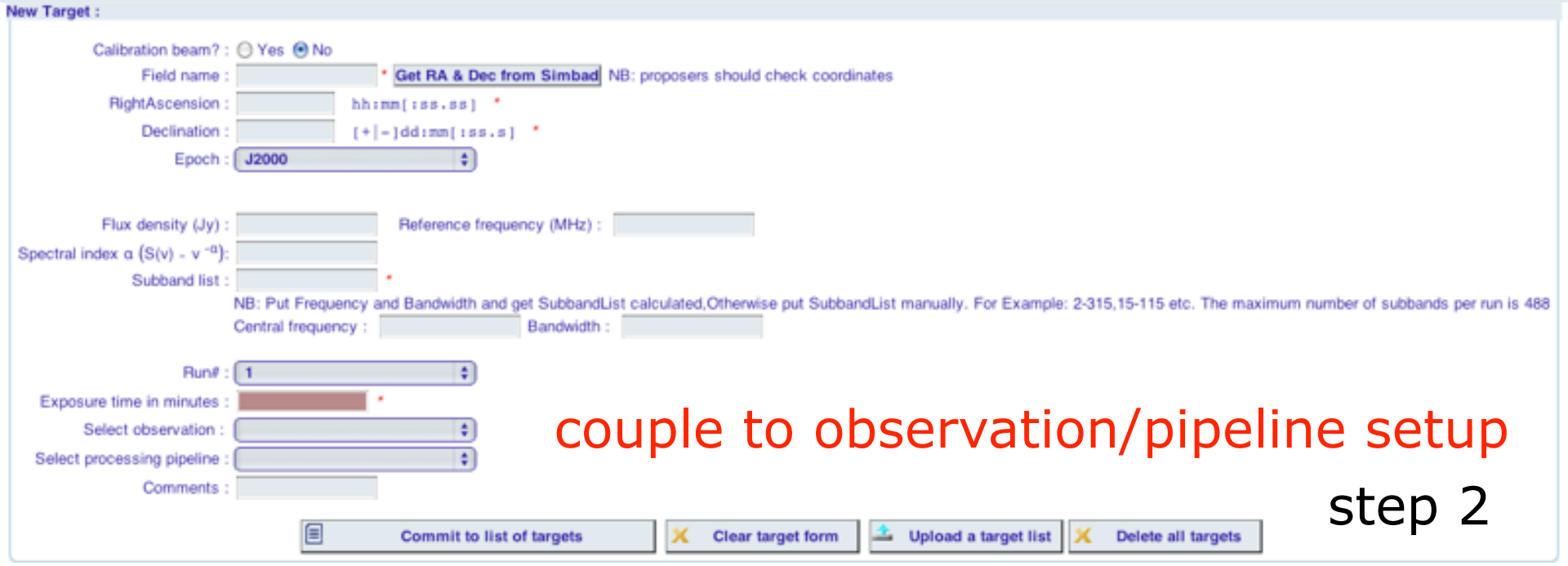

Pipeline configuration
Pre processing parameters
Processing mode: Pulsar pipeline *
Configuration comments : *
Commit Pipeline
Save and Continue
Save and Preview
Save and Exit
Save and Submit
Quit without save
Demixing sources : *
CygA
Pipeline configuration
Pre processing parameters
Processing mode: Long baseline calibration *
Flagging strategy : LBA *
Averaging time steps: 5 [steps] *
Averaging freq. steps : 16 [steps] *
Configuration comments : *
Commit Pipeline
Save and Continue
Save and Preview
Save and Exit
Save and Submit
Quit without save

NORTHSTAR

target specifications

Applicants | Justification | Observing Request | target list | Additional issues

- manual or upload list



couple to observation/pipeline setup

step 2

NORTHSTAR

target specifications

Applicants | Justification | Observing Request | target list | Additional issues

- manual or upload list

Targets :

Run#	Field	RA	Dec	Epoch	Time(Hours)	Subbands	Calibr.	Obs.	Pipe.	Comments			
1	3C196	08:13:36.07	+48:13:02.6	J2000	100	12..499		A	A	split in 10-12hr blocks	Edit	Copy	Delete
2	3C196	14:11:20.60	+52:12:09.0	J2000	0.17	55..420		B	B	flux cal	Edit	Copy	Delete
3	DF001	17:10:00.00	+60:50:00.0	J2000	6	55..420		B	C	target beam	Edit	Copy	Delete
	3C343	16:34:33.81	+62:45:36.0	J2000		55..77,401..420		B	B	cal beam	Edit	Copy	Delete
4	3C48	01:37:41.30	+33:09:35.1	J2000	0.17	55..420		B	B	flux cal	Edit	Copy	Delete
5	3C147	05:42:36.26	+49:51:07.1	J2000	1	52..467	Y	C	D	Calibrator Run#5-6	Edit	Copy	Delete
6	DC156	05:32:32.00	+52:50:00.1	J2000	6	52..467		C	E	Target Run#5-6	Edit	Copy	Delete
7	Fr479	06:03:00.00	+52:00:00.0	J2000	14	156..316		D	F	Target beam	Edit	Copy	Delete
	Fr480	07:08:00.00	+44:00:00.0	J2000		156..316		D	F	Target beam	Edit	Copy	Delete
	3C196	08:13:36.07	+48:13:02.6	J2000		156..316	Y	D	F	Calibrator beam	Edit	Copy	Delete
8	P0123	01:02:03.00	+82:00:00.0	J2000	1	256..300		E	G	Beamformed	Edit	Copy	Delete
9	empty	00:00:00.00	+00:00:00.0	J2000	1,500	55		F	H	TBB piggyback	Edit	Copy	Delete

New Target :

Calibration beam? : ○ Yes ◉ No

Field name : * Get RA & Dec from Simbad NB: proposers should check coordinates

RightAscension : hh:mm[:ss.ss] *

Declination : [+|-]dd:mm[:ss.s] *

Epoch : J2000

Flux density (Jy) : Reference frequency (MHz) :

Spectral index α ($S(\nu) \sim \nu^{-\alpha}$):

step 2

NORTHSTAR

setup completed

Applicants | Justification | Observing Request | Target List | Additional issues

Help

Id	Targets	Runs	Telescope	Mode	Exposure (Hours)	BF Data (TB)	Store Raw Data	UV Data (TB)	Store UV Data	TBB Data (TB)	Total LTA Storage (TB)			
A	1 targets	1 runs	LOFAR	Interferometer	100	0.0	NO	195.2	YES	0.0	195.2	Edit	Copy	Delete
B	3 targets	2 runs	LOFAR	Interferometer	6.17	0.0	NO	42.71	YES	0.0	42.71	Edit	Copy	Delete
C	2 targets	2 runs	LOFAR	Interferometer	7	0.0	NO	34.31	YES	0.0	34.31	Edit	Copy	Delete
D	3 targets	1 runs	LOFAR	Beam Observation-Interferometer	14	0.37	YES	4.83	YES	0.0	5.19	Edit	Copy	Delete
E	1 targets	1 runs	LOFAR	Beam Observation	1	0.04	YES	0.0	NO	0.0	0.04	Edit	Copy	Delete
F	0 targets	0 runs	LOFAR	Interferometer-TBB	0	0.0	NO	0.0	YES	0.0	0.0	Edit	Copy	Delete
G	0 targets	0 runs	LOFAR	TBBPIGGYBACK	0.28	0.0	NO	0.0	NO	6.13	6.13	Edit	Copy	Delete

Specify a new observation

Id	Targets	Telescope	Mode	av time	av freq	demixing	Total LTA Storage (TB)	P/O Ratio	Total Processing Time (Hours)			
A	1 targets	LOFAR	Pre processing only	1.0	1.0	Y(CygA,CasA)	253.76	3(1)	300	Edit	Copy	Delete
B	2 targets	LOFAR	Pre processing only	10.0	64.0	N	0.18	0.5(1) 1.5(1)	3.25	Edit	Copy	Delete
C	1 targets	LOFAR	Pre processing only	5.0	16.0	N	1.08	1.5(1)	9	Edit	Copy	Delete
D	1 targets	LOFAR	Calibration	10.0	64.0	N	0.07	1.5(1)	1.5	Edit	Copy	Delete
E	1 targets	LOFAR	Calibration + imaging	10.0	64.0	N	0.07	c:1.5i:0.9(1)	14.4	Edit	Copy	Delete
F	3 targets	LOFAR	Calibration	10.0	64.0	Y(CygA,CasA)	0.04	2(3)	28	Edit	Copy	Delete
G	1 targets	LOFAR	Pulsar pipeline			N	0.00	0.2(1)	0.2	Edit	Copy	Delete

Specify a new Pipeline :

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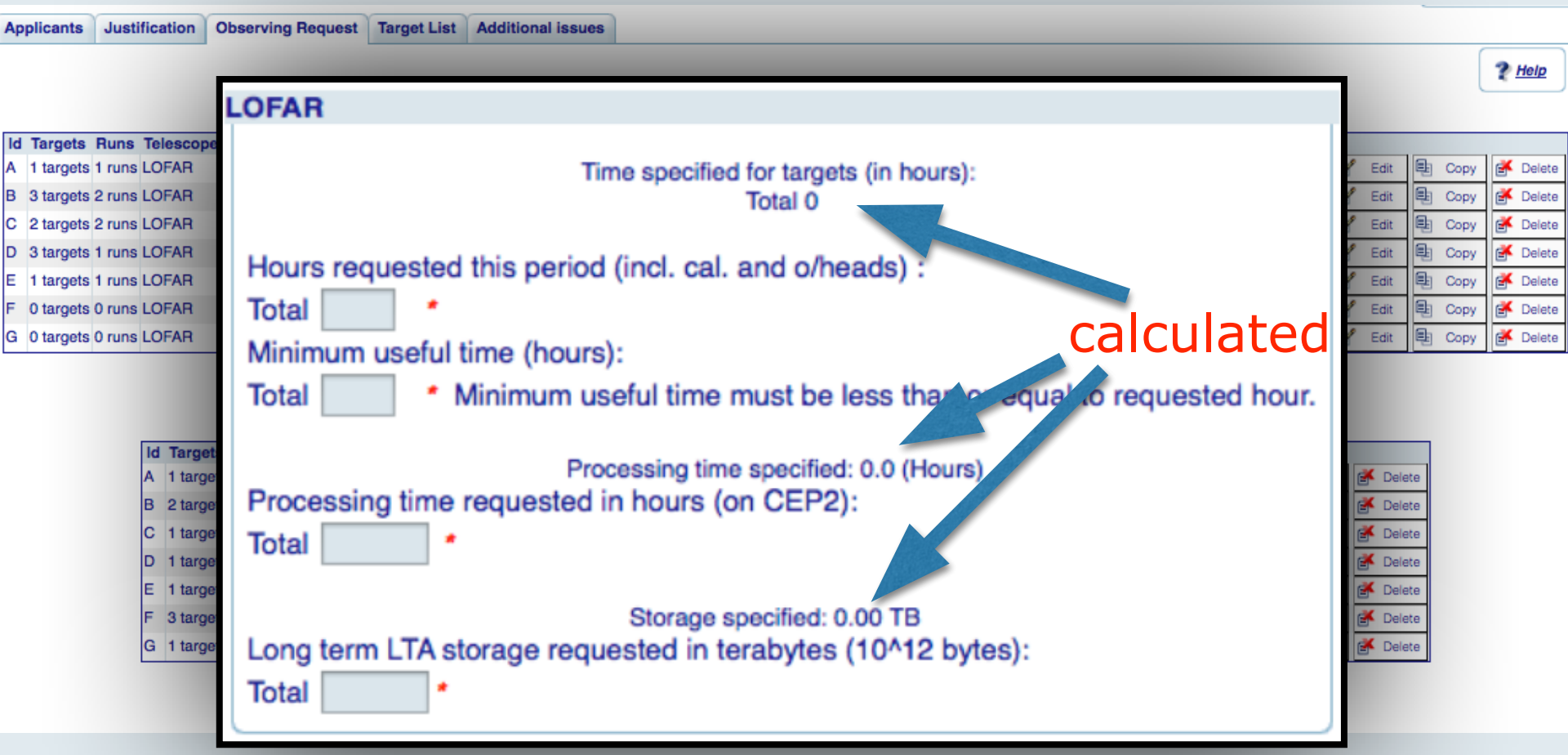
setup completed



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additional information

- final step

Information about all Students involved

add new student

Publications and relevant proposals

Add publications (Max 8) :
place each entry on a new line,
the following information has to be provided:
Publication - Authors, Title, Journal Reference
Proposals ? Instrument, cycle/code, status
(e.g., time awarded/completed/in progress)

mandatory field: publication/previous proposals

Additional Remarks :

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that’s all there is to it

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that's all there is to it

- **do not forget, next call for proposals ~ January 2015**

  - ✓ start early, read documentation
  - ✓ think ahead (know what you want/need)
  - ✓ be concise, to the point

THANK YOU