Aspro2 - 2024

AG JMMC

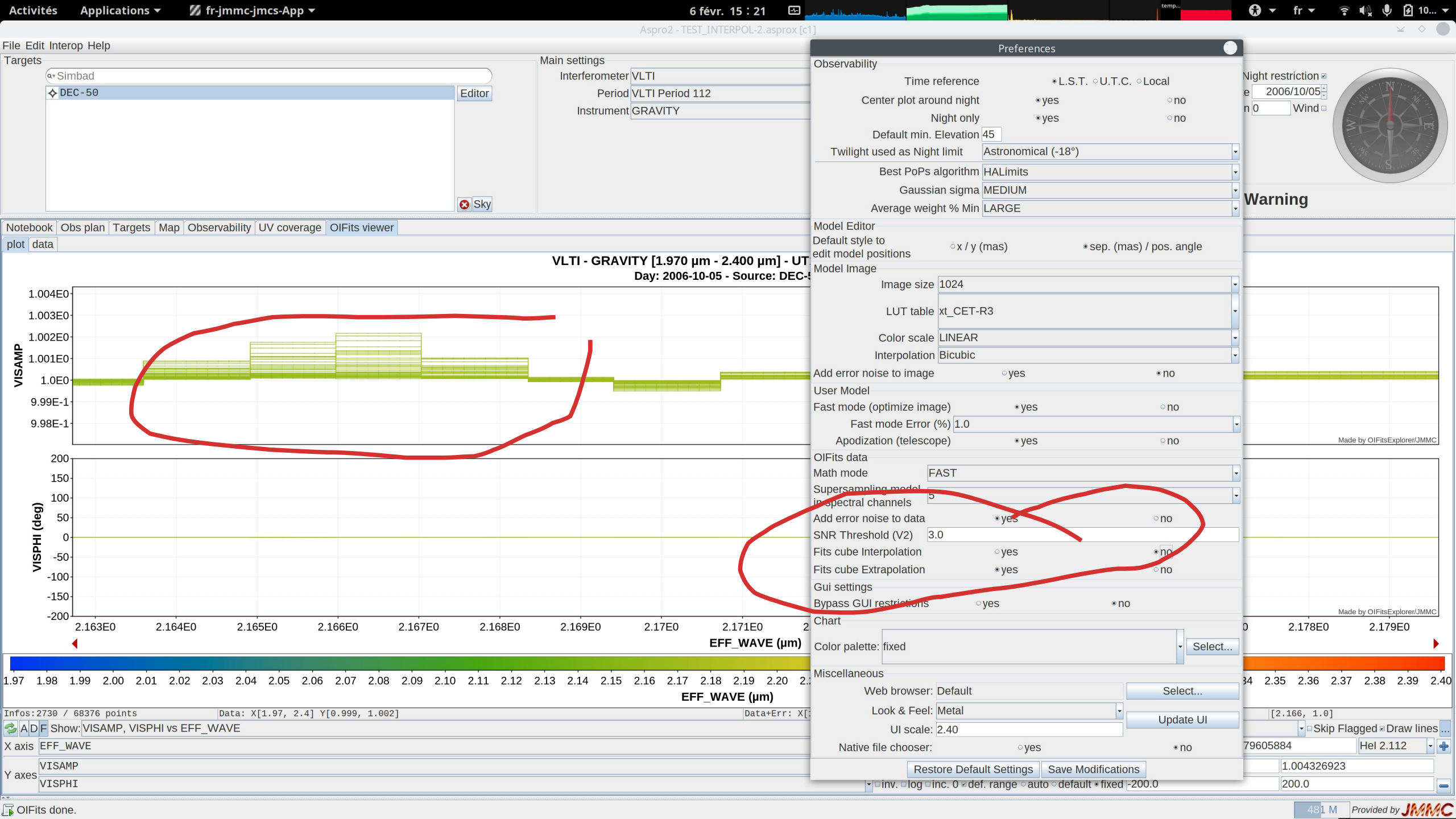
6 février 2024

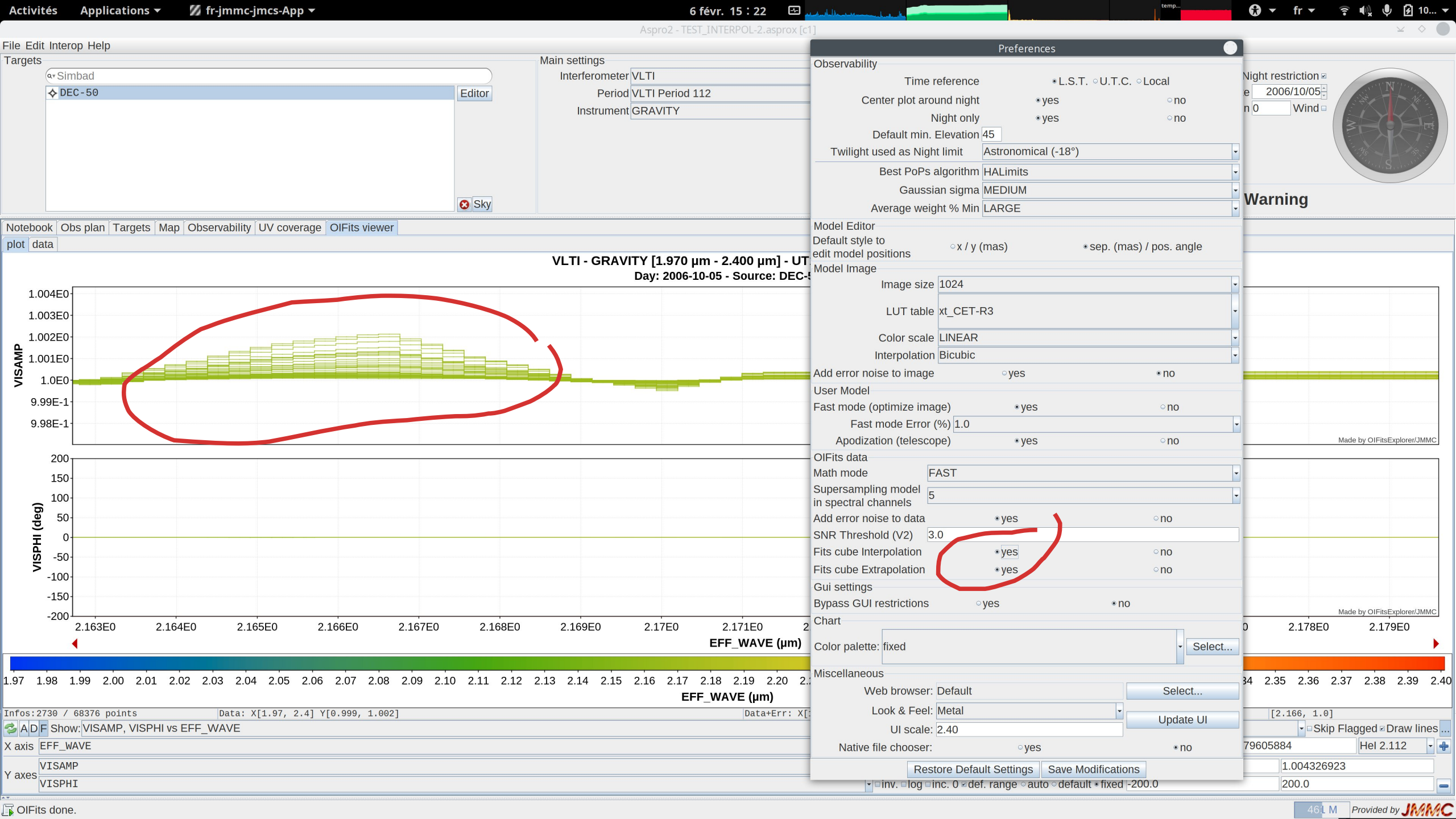
ENS Lyon

- Évolutions en 2023
- Plan d’actions 2024

Évolutions en 2023

- **Version 23.03**
  - Added double-path support for VLTI delay lines (J6 station)
- *Version 23.06 (VLTI school)*
  - Improved Target Model editor to simplify the User model interface and added more contextual information (max pixel size & Telescope Fov)
  - OIFitsExplorer: improved 'UV coverage' plot to be displayed as a squared plot
- **Version 23.09**
  - **Implemented both wavelength interpolation and extrapolation of user-defined models**
  - Improved noise modeling to correct the object flux (mag/jy) with the total flux values given by user-defined models + fill OI_FLUX tables with photon counts (FITS cube)
  - New warning: 'The model extension on target ... is potentially partly outside the telescope FOV'
  - Fixed user model support using unit = hertz (CUNIT3)


Activités
Applications
fr-jmmc-jmcs-App
6 févr. 15 : 21
fr
Aspro2 - TEST_INTERPOL-2.asprox [c1]
File Edit Interop Help
Targets
Simbad
DEC-50
Editor
Sky
Main settings
Interferometer VLTI
Period VLTI Period 112
Instrument GRAVITY
Night restriction
2006/10/05
Wind
Warning
Preferences
Observability
Time reference L.S.T. U.T.C. Local
Center plot around night yes no
Night only yes no
Default min. Elevation 45
Twilight used as Night limit Astronomical (-18°)
Best PoPs algorithm HALimits
Gaussian sigma MEDIUM
Average weight % Min LARGE
Model Editor
Default style to edit model positions x / y (mas) sep. (mas) / pos. angle
Model Image
Image size 1024
LUT table xt_CET-R3
Color scale LINEAR
Interpolation Bicubic
Add error noise to image yes no
User Model
Fast mode (optimize image) yes no
Fast mode Error (%) 1.0
Apodization (telescope) yes no
OIFits data
Math mode FAST
Supersampling model in spectral channels 5
Add error noise to data yes no
SNR Threshold (V2) 3.0
Fits cube Interpolation yes no
Fits cube Extrapolation yes no
Gui settings
Bypass GUI restrictions yes no
Chart
Color palette: fixed
Select...
Miscellaneous
Web browser: Default
Select...
Look & Feel: Metal
UI scale: 2.40
Update UI
Native file chooser: yes no
Restore Default Settings
Save Modifications
Notebook Obs plan Targets Map Observability UV coverage OIFits viewer
plot data
VLTI - GRAVITY [1.970 µm - 2.400 µm] - UT
Day: 2006-10-05 - Source: DEC-5
VISAMP
VISPHI (deg)
EFF_WAVE (µm)
Made by OIFitsExplorer/JMMC
Infos:2730 / 68376 points
Data: X[1.97, 2.4] Y[0.999, 1.002]
Data+Err: X[
[2.166, 1.0]
A D F Show: VISAMP, VISPHI vs EFF_WAVE
Skip Flagged Draw lines
X axis EFF_WAVE
Hel 2.112
Y axes VISAMP
VISPHI
1.004326923
200.0
inv log inc. 0 def. range auto default fixed -200.0
OIFits done.
481 M
Provided by JMMC


Activités
Applications
fr-jmmc-jmcs-App
6 févr. 15 : 22
fr
Aspro2 - TEST_INTERPOL-2.asprox [c1]
File Edit Interop Help
Targets
Simbad
DEC-50
Editor
Sky
Main settings
Interferometer VLTI
Period VLTI Period 112
Instrument GRAVITY
Night restriction
2006/10/05
Wind
Warning
Preferences
Observability
Time reference L.S.T. U.T.C. Local
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Night only yes no
Default min. Elevation 45
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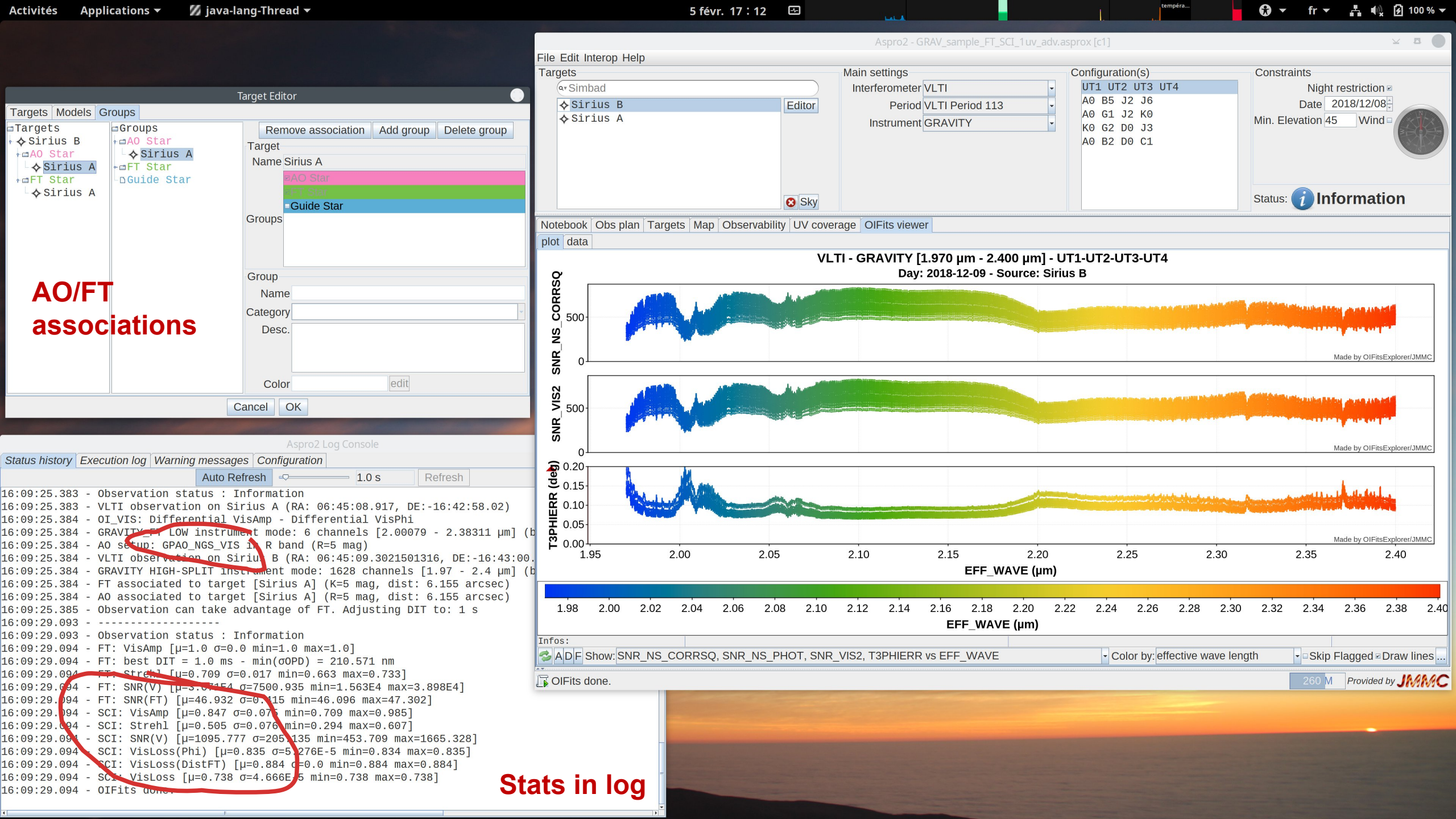
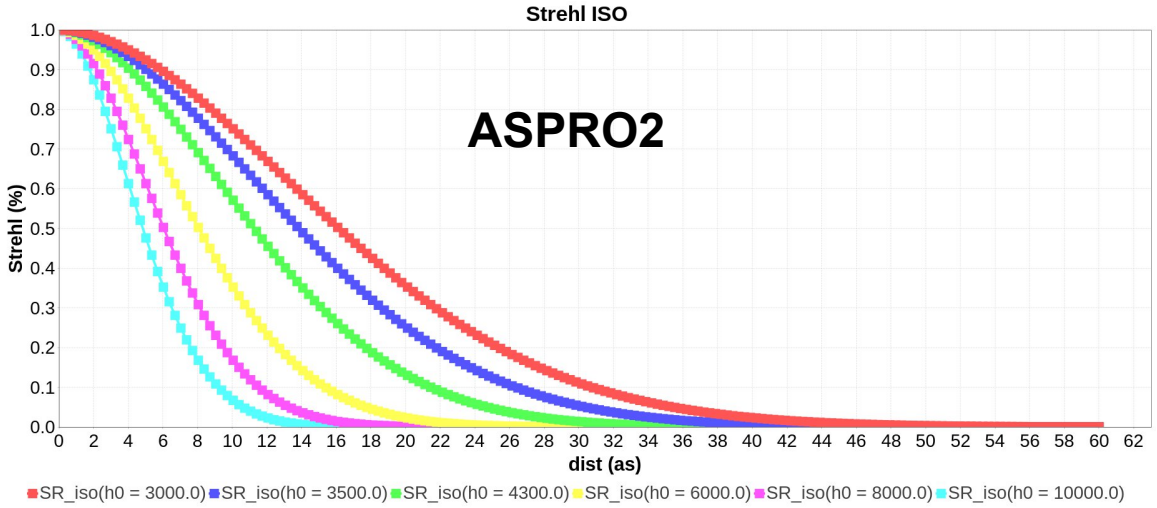
Average weight % Min LARGE
Model Editor
Default style to edit model positions x / y (mas) sep. (mas) / pos. angle
Model Image
Image size 1024
LUT table xt_CET-R3
Color scale LINEAR
Interpolation Bicubic
Add error noise to image yes no
User Model
Fast mode (optimize image) yes no
Fast mode Error (%) 1.0
Apodization (telescope) yes no
OIFits data
Math mode FAST
Supersampling model in spectral channels 5
Add error noise to data yes no
SNR Threshold (V2) 3.0
Fits cube Interpolation yes no
Fits cube Extrapolation yes no
Gui settings
Bypass GUI restrictions yes no
Chart
Color palette: fixed
Select...
Miscellaneous
Web browser: Default
Select...
Look & Feel: Metal
Update UI
UI scale: 2.40
Native file chooser: yes no
Restore Default Settings
Save Modifications
Notebook Obs plan Targets Map Observability UV coverage OIFits viewer
plot data
VLTI - GRAVITY [1.970 µm - 2.400 µm] - UT
Day: 2006-10-05 - Source: DEC-5
VISAMP
VISPHI (deg)
EFF_WAVE (µm)
Made by OIFitsExplorer/JMMC
Infos:2730 / 68376 points
Data: X[1.97, 2.4] Y[0.999, 1.002]
Data+Err: X[
[2.166, 1.0]
A D F Show: VISAMP, VISPHI vs EFF_WAVE
Skip Flagged
Draw lines
X axis EFF_WAVE
Hel 2.112
Y axes VISAMP
VISPHI
1.004326923
200.0
inv. log inc. 0 def. range auto default fixed -200.0
OIFits done.
461 M
Provided by JMMC

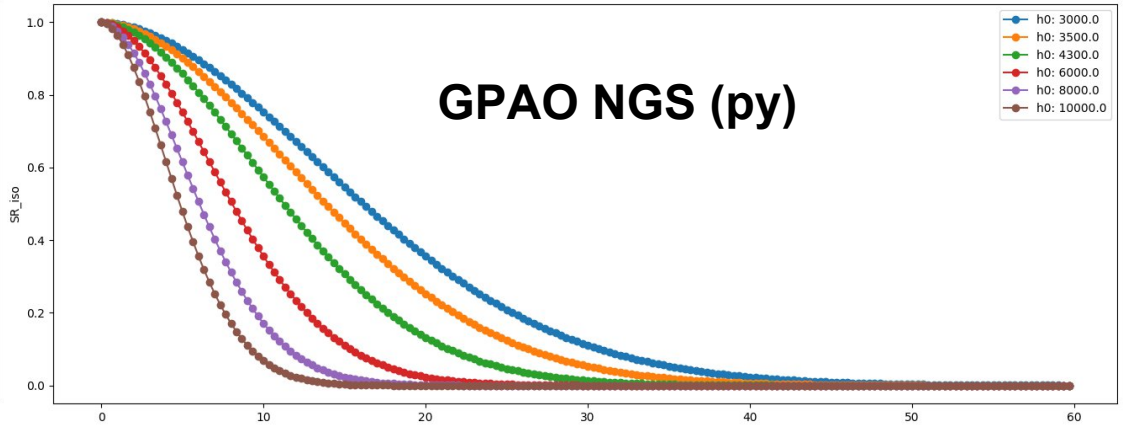
Évolutions en 2023

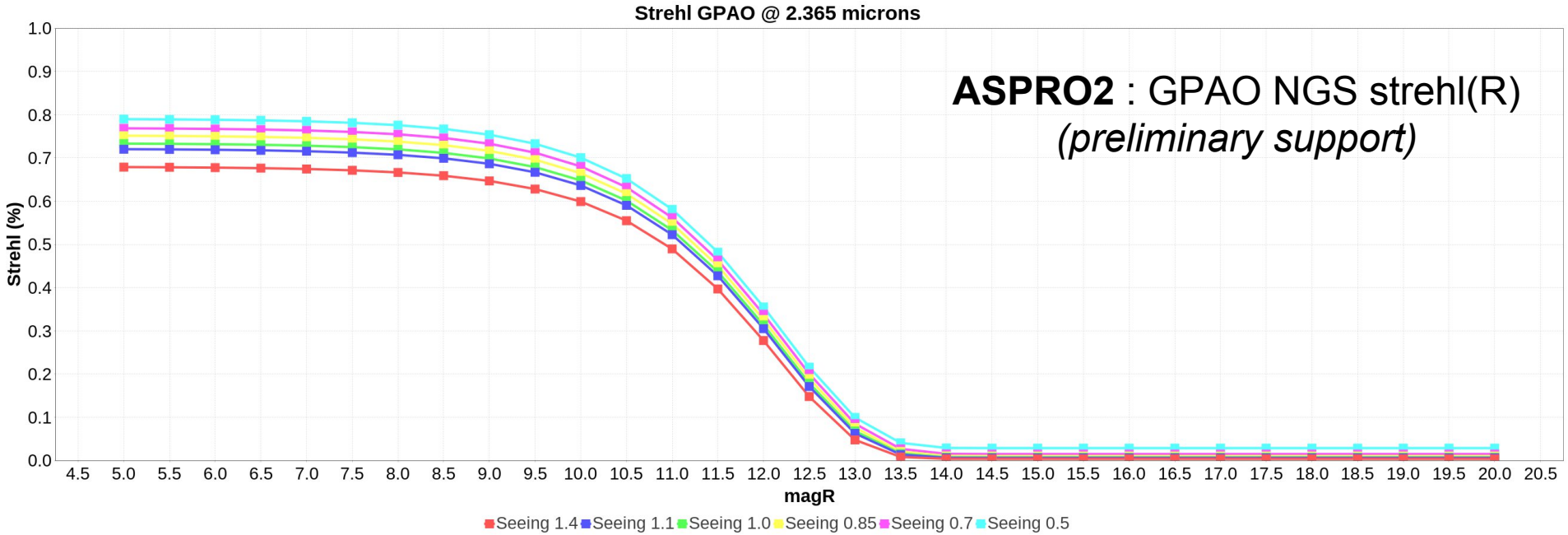
- *Version 24.01 β*
  - Implemented the **Strehl Isoplanetism error** (VLTI AO only) made in collaboration with **Dr. Anthony Berdeu, LESIA, ObsPM**, whose project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004719.
  - Implemented preliminary support for **GPAO NGS** coming on sky in Summer 24
  - Implemented **GRAVITY's background noise & transmission model**
  - Implemented the **GRAVITY FT bootstrapping for baselines** (triangle method) and the visibility loss for off-axis fringe tracking
  - Improved warning messages with computed statistics
  - Major rewriting of the OIFits generator to handle two simulated OIFITS (FT + SCI) for GRAVITY (compute SNR_FT & variance on OPD) used to determine the **visibility loss on the science detector** (GRAVITY or MATISSE) in collaboration with **Dr. Taro Shimizu, MPE**


Activités
Applications
java-lang-Thread
5 févr. 17 : 12
fr
100 %
Target Editor
Targets
Models
Groups
Targets
Sirius B
AO Star
Sirius A
FT Star
Sirius A
Groups
AO Star
Sirius A
FT Star
Guide Star
Remove association
Add group
Delete group
Target
Name Sirius A
AO Star
FT Star
Guide Star
Groups
Group
Name
Category
Desc.
Color
edit
Cancel
OK
AO/FT associations
Aspro2 - GRAV_sample_FT_SCI_1uv_adv.asprox [c1]
File Edit Interop Help
Targets
Simbad
Sirius B
Sirius A
Editor
Sky
Main settings
Interferometer VLTI
Period VLTI Period 113
Instrument GRAVITY
Configuration(s)
UT1 UT2 UT3 UT4
A0 B5 J2 J6
A0 G1 J2 K0
K0 G2 D0 J3
A0 B2 D0 C1
Constraints
Night restriction
Date 2018/12/08
Min. Elevation 45
Wind
Status: Information
Notebook
Obs plan
Targets
Map
Observability
UV coverage
OIFits viewer
plot
data
VLTI - GRAVITY [1.970 µm - 2.400 µm] - UT1-UT2-UT3-UT4
Day: 2018-12-09 - Source: Sirius B
SNR_NS_CORRSQ
SNR_VIS2
T3PHIERR (deg)
Made by OIFitsExplorer/JMMC
EFF_WAVE (µm)
Infos:
A D F Show: SNR_NS_CORRSQ, SNR_NS_PHOT, SNR_VIS2, T3PHIERR vs EFF_WAVE
Color by: effective wave length
Skip Flagged
Draw lines
OIFits done.
260 M
Provided by JMMC
Aspro2 Log Console
Status history
Execution log
Warning messages
Configuration
Auto Refresh
1.0 s
Refresh
16:09:25.383 - Observation status : Information
16:09:25.383 - VLTI observation on Sirius A (RA: 06:45:08.917, DE:-16:42:58.02)
16:09:25.384 - OI_VIS: Differential VisAmp - Differential VisPhi
16:09:25.384 - GRAVITY_FT LOW instrument mode: 6 channels [2.00079 - 2.38311 µm] (b
16:09:25.384 - AO setup: GPAO_NGS_VIS in R band (R=5 mag)
16:09:25.384 - VLTI observation on Sirius B (RA: 06:45:09.3021501316, DE:-16:43:00.
16:09:25.384 - GRAVITY HIGH-SPLIT instrument mode: 1628 channels [1.97 - 2.4 µm] (b
16:09:25.384 - FT associated to target [Sirius A] (K=5 mag, dist: 6.155 arcsec)
16:09:25.384 - AO associated to target [Sirius A] (R=5 mag, dist: 6.155 arcsec)
16:09:25.385 - Observation can take advantage of FT. Adjusting DIT to: 1 s
16:09:29.093 - ------------------
16:09:29.093 - Observation status : Information
16:09:29.094 - FT: VisAmp [µ=1.0 σ=0.0 min=1.0 max=1.0]
16:09:29.094 - FT: best DIT = 1.0 ms - min(σOPD) = 210.571 nm
16:09:29.094 - FT: Strehl [µ=0.709 σ=0.017 min=0.663 max=0.733]
16:09:29.094 - FT: SNR(V) [µ=3.071E4 σ=7500.935 min=1.563E4 max=3.898E4]
16:09:29.094 - FT: SNR(FT) [µ=46.932 σ=0.115 min=46.096 max=47.302]
16:09:29.094 - SCI: VisAmp [µ=0.847 σ=0.076 min=0.709 max=0.985]
16:09:29.094 - SCI: Strehl [µ=0.505 σ=0.076 min=0.294 max=0.607]
16:09:29.094 - SCI: SNR(V) [µ=1095.777 σ=205.135 min=453.709 max=1665.328]
16:09:29.094 - SCI: VisLoss(Phi) [µ=0.835 σ=5.276E-5 min=0.834 max=0.835]
16:09:29.094 - SCI: VisLoss(DistFT) [µ=0.884 σ=0.0 min=0.884 max=0.884]
16:09:29.094 - SCI: VisLoss [µ=0.738 σ=4.666E-5 min=0.738 max=0.738]
16:09:29.094 - OIFits done.
Stats in log

Ex du Strehl isoplanetism (dist AO – FT/SCI)







Plan d’actions 2024

- Poursuivre intégration GRAVITY+ et GPAO NGS / LGS (laser)
- Support modèles chromatiques (température ~ black body)
- Mise à jour modèle de bruit SPICA (+FT)
- Améliorer la gestion des targets (groupes + filtrage de la table) pour aider les ‘large programs’
- Améliorer la gestion des observations multi-instruments

AOB ? CHARA 7T, new instruments (silmaril, asgard) ?