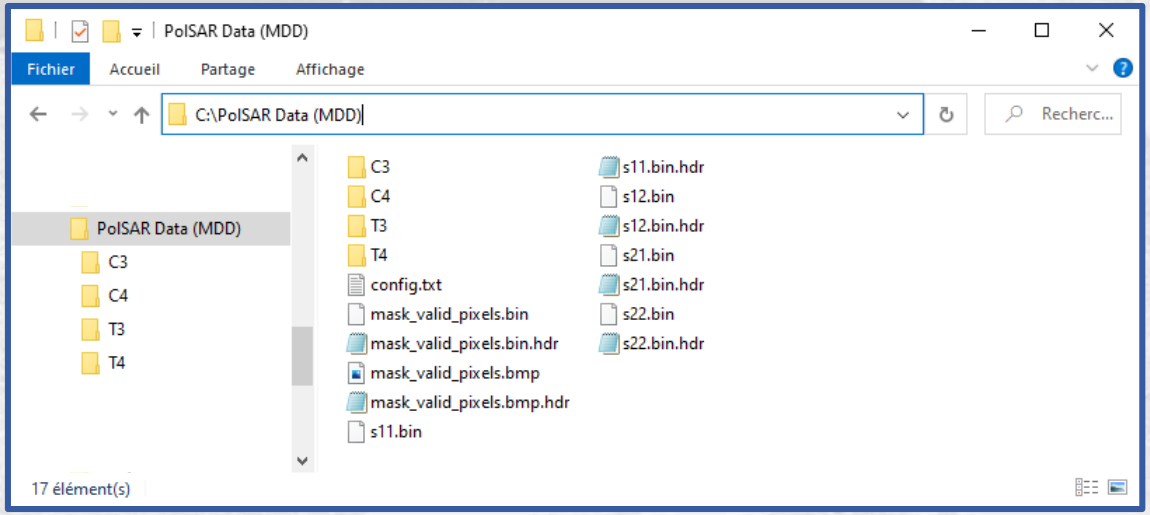
POLSARPRO

PRESENTS

PolSARpro v6.0 (Biomass Edition)

POLARIMETRIC DATA FOLDER STRUCTURE & CONTENTS

2x2 Complex Sinclair Matrix [S2]



PolarType

- Full s11.bin, s12.bin, s21.bin, s22.bin

PolarCase

- Monostatic s12.bin == s21.bin
- Bistatic s12.bin <> s21.bin

$$[S_2] = \begin{bmatrix} S_{11} & S_{12} \\ S_{21} & S_{22} \end{bmatrix}$$

Nrow
1234

Ncol
4789

PolarCase
Monostatic or Bistatic

PolarType
Full

config.txt

DATADIR

config.txt

s11.bin, s12.bin
s21.bin, s22.bin

s11.bin.hdr, s12.bin.hdr
s21.bin.hdr, s22.bin.hdr

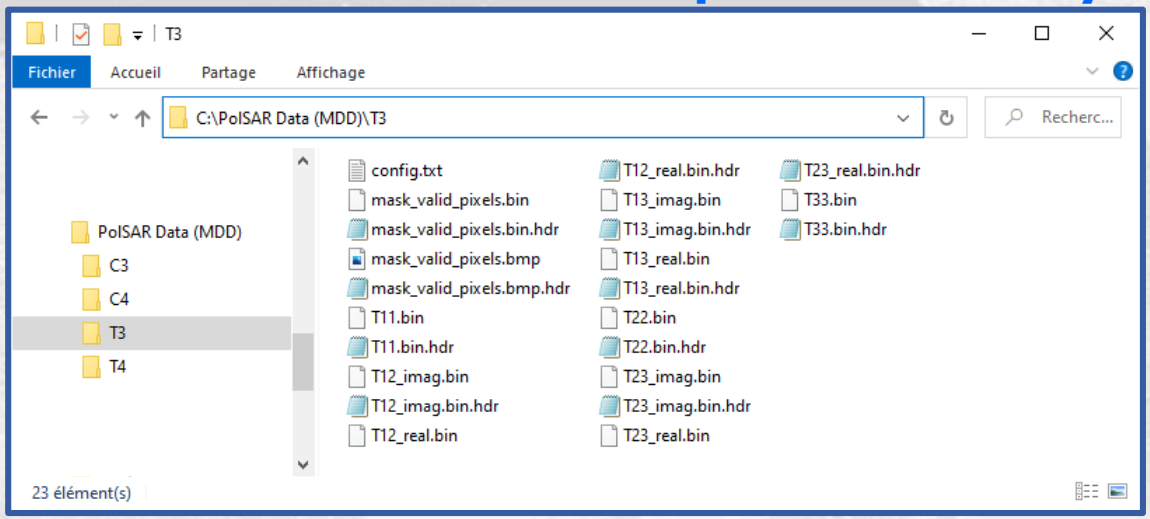
mask_valid_pixels.bin

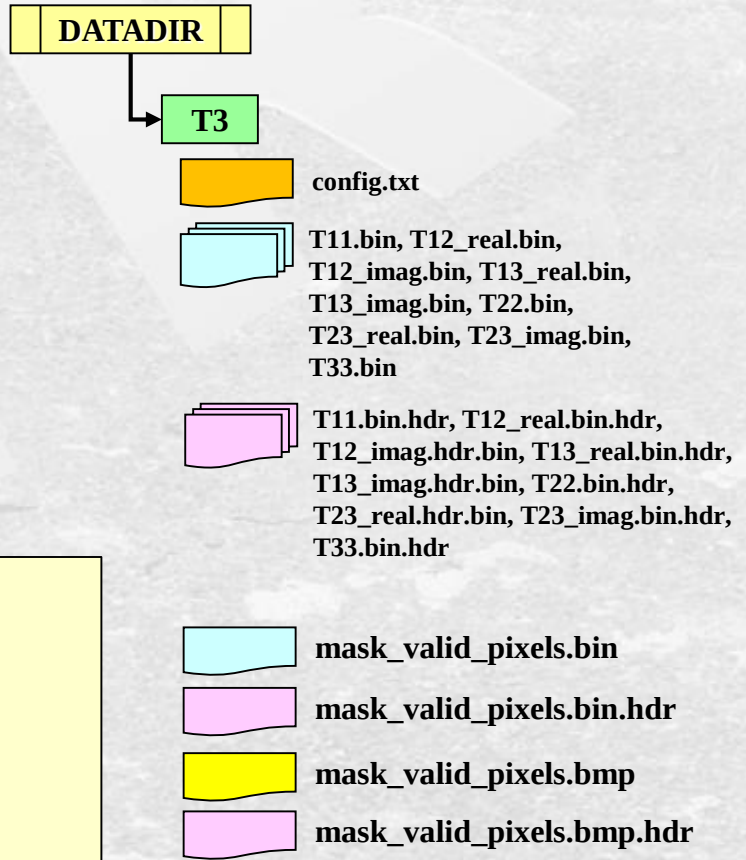
mask_valid_pixels.bin.hdr

mask_valid_pixels.bmp

mask_valid_pixels.bmp.hdr

3x3 Complex Coherency Matrix [T3]





$$\vec{k}_{3P} = \frac{1}{\sqrt{2}}\left[S_{11}+S_{22} \quad S_{11}-S_{22} \quad S_{12}+S_{21}\right]^T$$

$$\Rightarrow \quad [T_3] = \left\langle \vec{k}_{3P} \cdot \vec{k}_{3P}^{T*} \right\rangle = \begin{bmatrix} T_{11} & T_{12} & T_{13} \\ T_{12}^* & T_{22} & T_{23} \\ T_{13}^* & T_{23}^* & T_{33} \end{bmatrix}$$

Nrow
1234

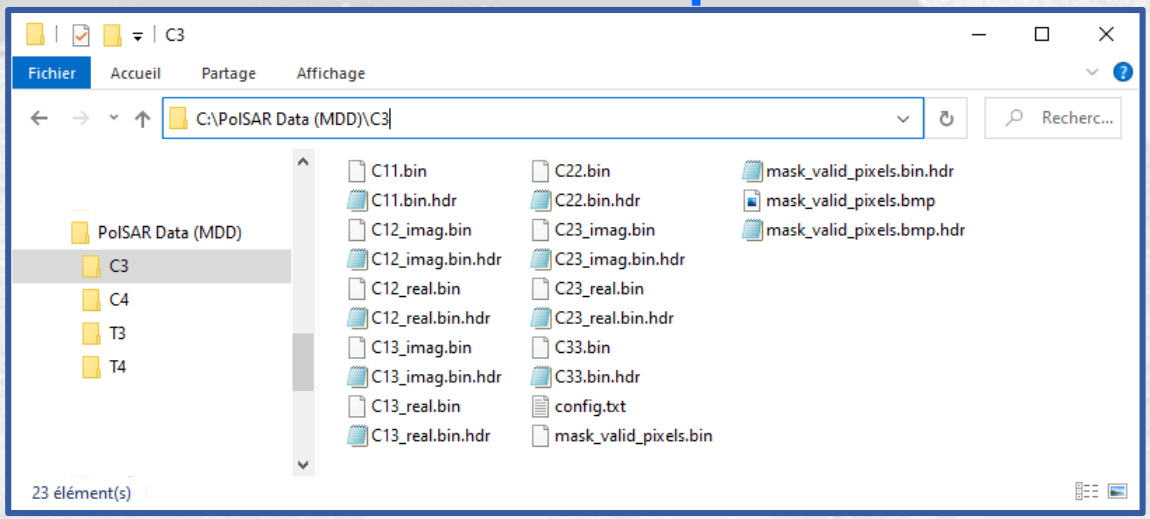
Ncol
4789

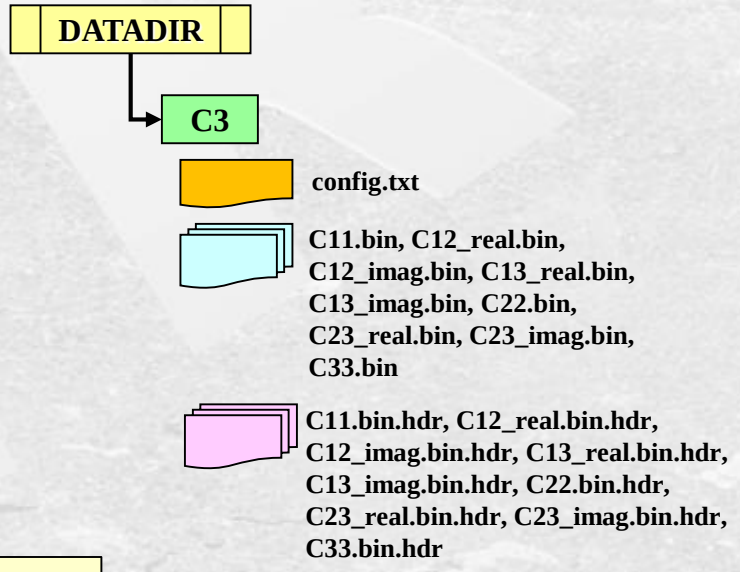
PolarCase
Monostatic

PolarType
Full

config.txt

3x3 Complex Covariance Matrix [C3]





$$\vec{k}_{3L} = \begin{bmatrix} s_{11} & \sqrt{2}s_{12} & s_{22} \end{bmatrix}^T$$

$$\Rightarrow \quad [C_3] = \left\langle \vec{k}_{3L} \cdot \vec{k}_{3L}^{T*} \right\rangle = \begin{bmatrix} C_{11} & C_{12} & C_{13} \\ C_{12}^* & C_{22} & C_{23} \\ C_{13}^* & C_{23}^* & C_{33} \end{bmatrix}$$

Nrow
1234

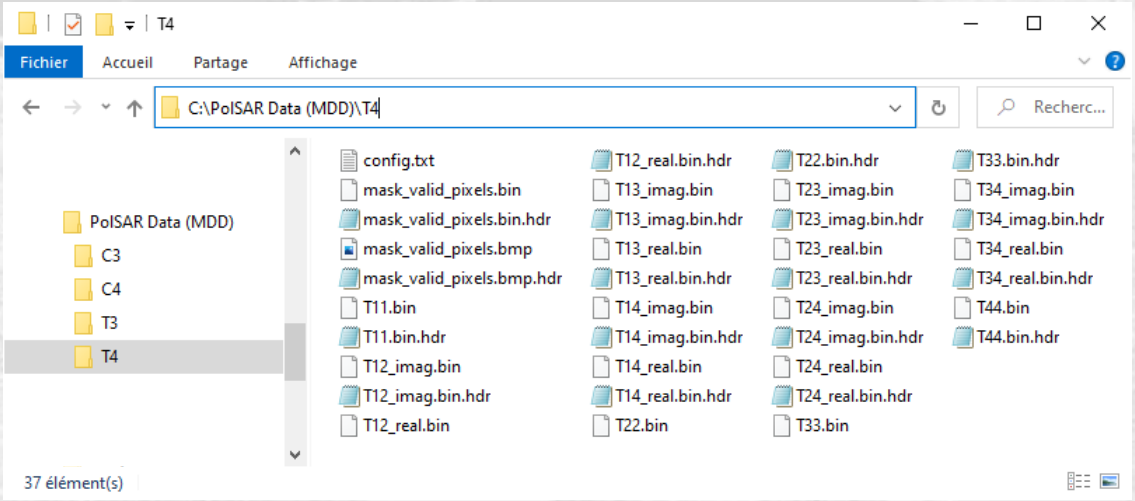
Ncol
4789

PolarCase
Monostatic

PolarType
Full

config.txt

4x4 Complex Coherency Matrix [T4]



$$\vec{k}_{4P} = \frac{1}{\sqrt{2}}\left[s_{11}+s_{22} \quad s_{11}-s_{22} \quad s_{12}+s_{21} \quad j\left(s_{12}-s_{21}\right)\right]^T$$

$$\Rightarrow \quad [T_4] = \left\langle \vec{k}_{4P} \cdot \vec{k}_{4P}^{T*} \right\rangle = \begin{bmatrix} T_{11} & T_{12} & T_{13} & T_{14} \\ T_{12}^* & T_{22} & T_{23} & T_{24} \\ T_{13}^* & T_{23}^* & T_{33} & T_{34} \\ T_{14}^* & T_{24}^* & T_{34}^* & T_{44} \end{bmatrix}$$

Nrow
1234

Ncol
4789

PolarCase
Bistatic

PolarType
Full

config.txt

DATADIR

T4

config.txt

T11.bin, T12_real.bin,
T12_imag.bin, T13_real.bin,
T13_imag.bin, T14_real.bin,
T14_imag.bin, T22.bin,
T23_real.bin, T23_imag.bin,
T24_real.bin, T24_imag.bin,
T33.bin, T34_real.bin,
T34_imag.bin, T44.bin

T11.bin.hdr, T12_real.bin.hdr,
T12_imag.bin.hdr, T13_real.bin.hdr,
T13_imag.bin.hdr, T14_real.bin.hdr,
T14_imag.bin.hdr, T22.bin.hdr,
T23_real.bin.hdr, T23_imag.bin.hdr,
T24_real.bin.hdr, T24_imag.bin.hdr,
T33.bin.hdr, T34_real.bin.hdr,
T34_imag.bin.hdr, T44.bin.hdr

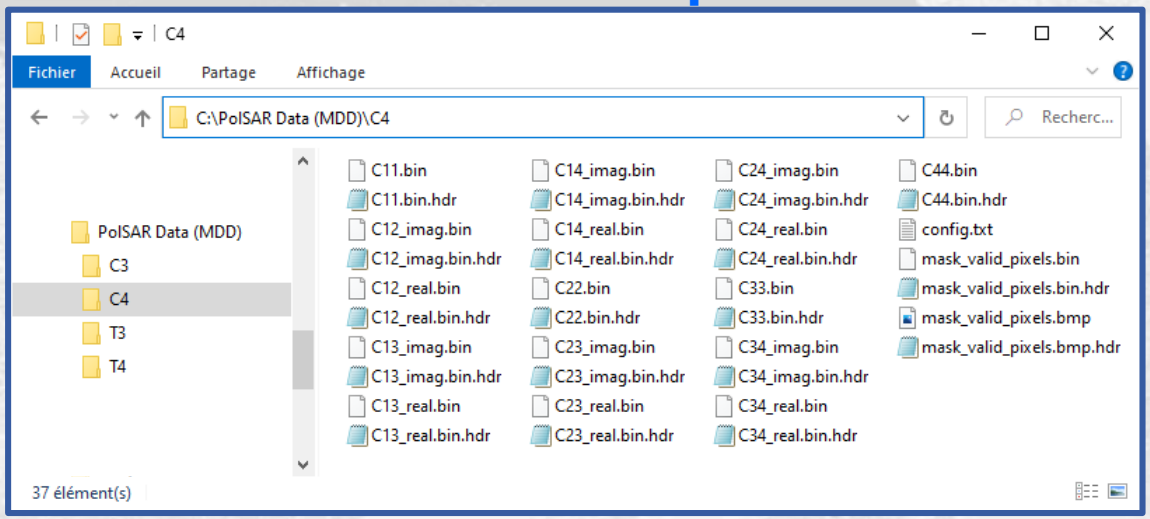
mask_valid_pixels.bin

mask_valid_pixels.bin.hdr

mask_valid_pixels.bmp

mask_valid_pixels.bmp.hdr

4x4 Complex Covariance Matrix [C4]



$$\vec{k}_{4L} = \begin{bmatrix} S_{11} & S_{12} & S_{21} & S_{22} \end{bmatrix}^T$$

$$\Rightarrow \quad [C_4] = \left\langle \vec{k}_{4L} \cdot \vec{k}_{4L}^{T*} \right\rangle = \begin{bmatrix} C_{11} & C_{12} & C_{13} & C_{14} \\ C_{12}^* & C_{22} & C_{23} & C_{24} \\ C_{13}^* & C_{23}^* & C_{33} & C_{34} \\ C_{14}^* & C_{24}^* & C_{34}^* & C_{44} \end{bmatrix}$$

Nrow
1234

Ncol
4789

PolarCase
Bistatic

PolarType
Full

config.txt

DATADIR

C4

config.txt

C11.bin, C12_real.bin, C12_imag.bin, C13_real.bin, C13_imag.bin, C14_real.bin, C14_imag.bin, C22.bin, C23_real.bin, C23_imag.bin, C24_real.bin, C24_imag.bin, C33.bin, C34_real.bin, C34_imag.bin, C44.bin

C11.bin.hdr, C12_real.bin.hdr, C12_imag.bin.hdr, C13_real.bin.hdr, C13_imag.bin.hdr, C14_real.bin.hdr, C14_imag.bin.hdr, C22.bin.hdr, C23_real.bin.hdr, C23_imag.bin.hdr, C24_real.bin.hdr, C24_imag.bin.hdr, C33.bin.hdr, C34_real.bin.hdr, C34_imag.bin.hdr, C44.bin.hdr

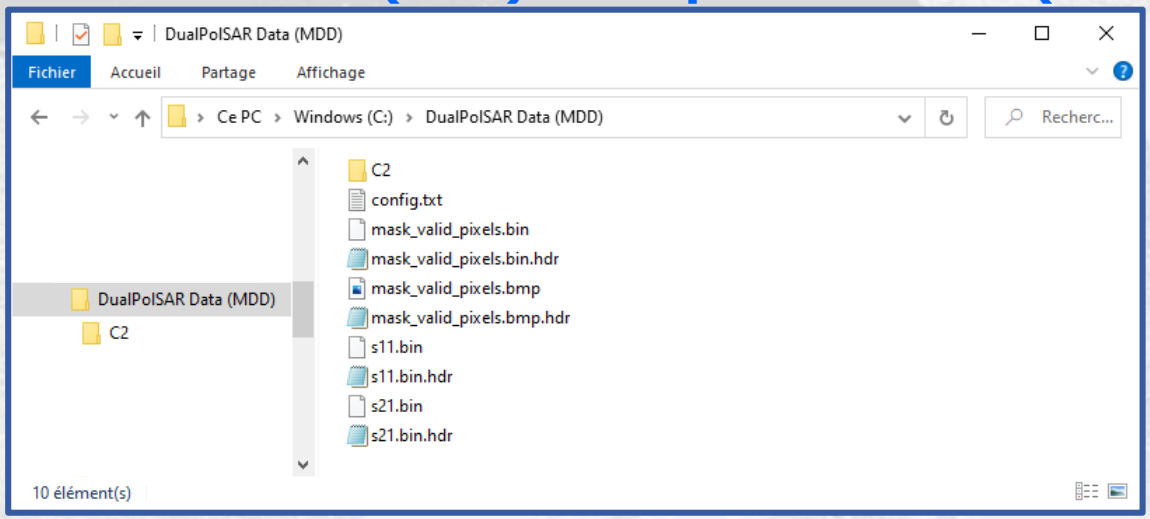
mask_valid_pixels.bin

mask_valid_pixels.bin.hdr

mask_valid_pixels.bmp

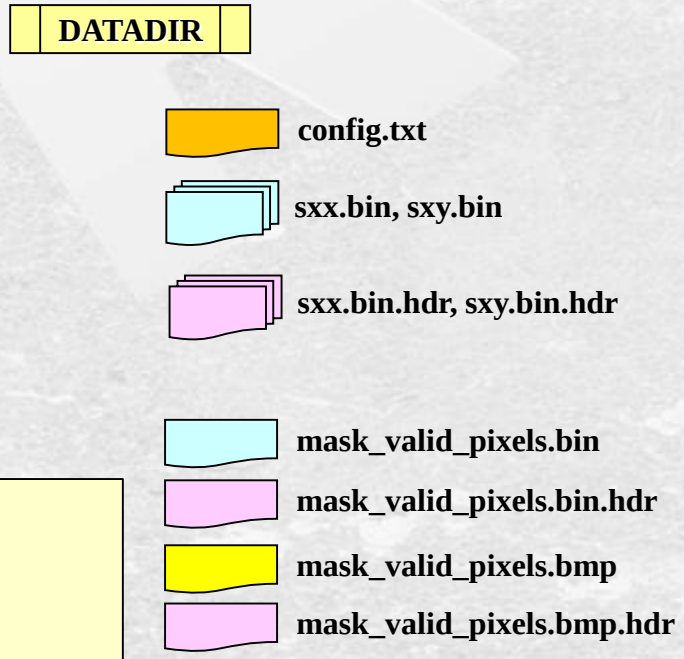
mask_valid_pixels.bmp.hdr

(2x1) dual-polarimetric (Sxx, Sxy) vector



PolarCase
- Monostatic

PolarType
- pp1 s11.bin, s21.bin
- pp2 s12.bin, s22.bin
- pp3 s11.bin, s22.bin



Nrow
1234

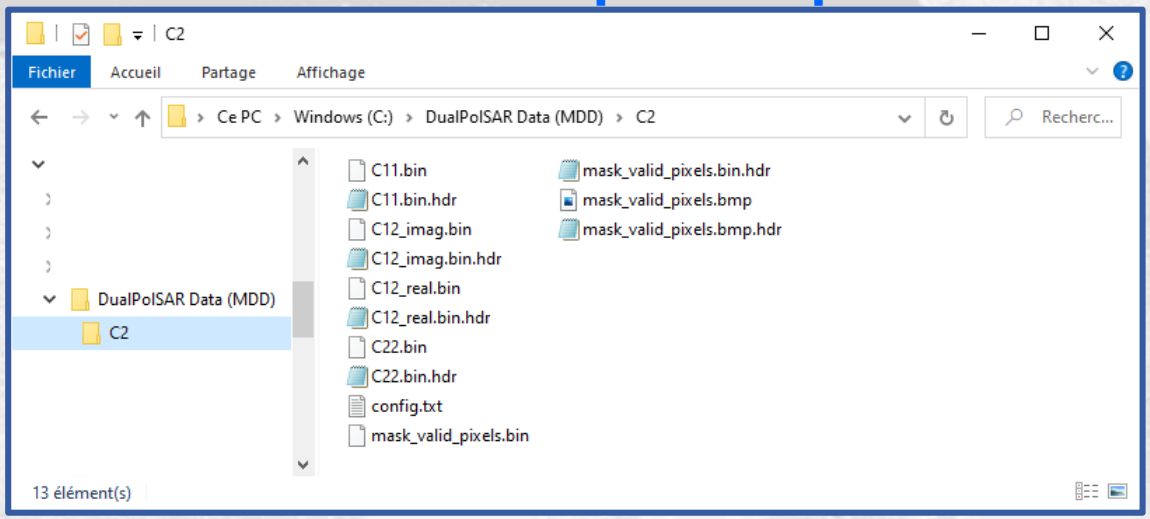
Ncol
4789

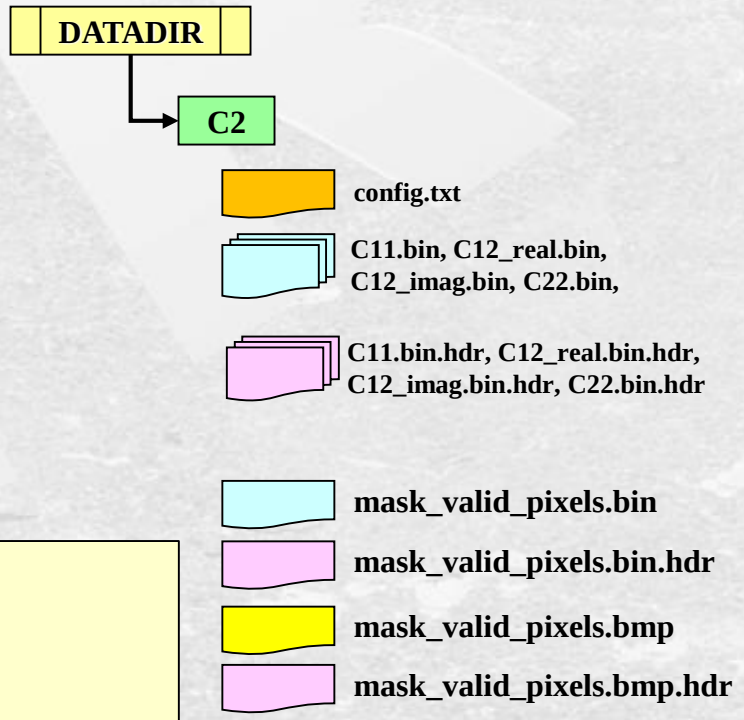
PolarCase
Monostatic

PolarType
Pp1 or pp2 or pp3

config.txt

2x2 Dual-pol Complex Covariance Matrix [C2]





PolarCase
- Monostatic

PolarType
- pp1 s11.bin, s21.bin
- pp2 s12.bin, s22.bin
- pp3 s11.bin, s22.bin

$$\vec{k}_{2L} = \begin{bmatrix} s_{xx} & s_{xy} \end{bmatrix}^T$$

$$\Rightarrow \quad [C_2] = \left\langle \vec{k}_{2L} \cdot \vec{k}_{2L}^{T*} \right\rangle = \begin{bmatrix} C_{11} & C_{12} \\ C_{12}^* & C_{22} \end{bmatrix}$$

Nrow
1234

Ncol
4789

PolarCase
Monostatic

PolarType
Pp1 or pp2 or pp3

config.txt

Full-polarimetric Pol-InSAR data

MASTER DATADIR

- config.txt
- s11.bin, s12.bin
  s21.bin, s22.bin
- s11.bin.hdr, s12.bin.hdr
  s21.bin.hdr, s22.bin.hdr
- mask_valid_pixels.xxx

SLAVE DATADIR

- config.txt
- s11.bin, s12.bin
  s21.bin, s22.bin
- s11.bin.hdr, s12.bin.hdr
  s21.bin.hdr, s22.bin.hdr
- flat_earth.bin, kz.bin
- mask_valid_pixels.xxx

$$\vec{k}_{3P}^{M} = \frac{1}{\sqrt{2}}\left[s_{11}^{M} + s_{22}^{M} \quad s_{11}^{M} - s_{22}^{M} \quad s_{12}^{M} + s_{21}^{M} \right]^{T}$$

$$\vec{k}_{3P}^{S} = \frac{1}{\sqrt{2}}\left[s_{11}^{S} + s_{22}^{S} \quad s_{11}^{S} - s_{22}^{S} \quad s_{12}^{S} + s_{21}^{S} \right]^{T}$$

$$\vec{k}_{6P}^{M+S} = \left[\vec{k}_{3P}^{M} \quad \vec{k}_{3P}^{S} \right]^{T}$$

$$\left[T_{6}^{M+S} \right] = \left\langle \vec{k}_{6P}^{M+S} \cdot \left(\vec{k}_{6P}^{M+S} \right)^{T*} \right\rangle$$

Full-polarimetric Pol-InSAR data

MASTER DATADIR

- config.txt
- s11.bin, s12.bin
  s21.bin, s22.bin
- s11.bin.hdr, s12.bin.hdr
  s21.bin.hdr, s22.bin.hdr
- mask_valid_pixels.xxx

SLAVE DATADIR

- config.txt
- s11.bin, s12.bin
  s21.bin, s22.bin
- s11.bin.hdr, s12.bin.hdr
  s21.bin.hdr, s22.bin.hdr
- flat_earth.bin, kz.bin
- mask_valid_pixels.xxx

MASTER DATADIR_SLAVE DATADIR

- T6
  - config.txt
  - T11.bin,
    T12_real.bin, T12_imag.bin,
    T13_real.bin, T13_imag.bin,
    T14_real.bin, T14_imag.bin,
    T15_real.bin, T15_imag.bin,
    T16_real.bin, T16_imag.bin,
    T22.bin,
    T23_real.bin, T23_imag.bin,
    T24_real.bin, T24_imag.bin,
    T25_real.bin, T25_imag.bin,
    T26_real.bin, T26_imag.bin,
    T33.bin,
    T34_real.bin, T34_imag.bin,
    T35_real.bin, T25_imag.bin,
    T36_real.bin, T36_imag.bin,
    T44.bin,
    T45_real.bin, T45_imag.bin,
    T46_real.bin, T46_imag.bin,
    T55.bin,
    T56_real.bin, T56_imag.bin,
    T66.bin.
  - Txx.bin.hdr,
    Txy_real.bin.hdr, Txy_imag.bin.hdr…
  - mask_valid_pixels.xxx

Dual-polarimetric Pol-InSAR data

MASTER DATADIR

- config.txt
- sxx.bin, sxy.bin
- sxx.bin.hdr, sxy.bin.hdr
- mask_valid_pixels.xxx

SLAVE DATADIR

- config.txt
- sxx.bin, sxy.bin
- sxx.bin.hdr, sxy.bin.hdr
- flat_earth.bin, kz.bin
- mask_valid_pixels.xxx

$$\vec{k}_{2P}^{M} = \frac{1}{\sqrt{2}}\left[s_{xx}^{M} - s_{xy}^{M} \quad s_{xx}^{M} + s_{xy}^{M} \right]^{T}$$

$$\vec{k}_{2P}^{S} = \frac{1}{\sqrt{2}}\left[s_{xx}^{S} - s_{xy}^{S} \quad s_{xx}^{S} + s_{xy}^{S} \right]^{T}$$

$$\vec{k}_{4P}^{M+S} = \left[\vec{k}_{2P}^{M} \quad \vec{k}_{2P}^{S} \right]^{T}$$

$$\left[T_4^{M+S} \right] = \left\langle \vec{k}_{4P}^{M+S} \cdot \left(\vec{k}_{4P}^{M+S} \right)^{T*} \right\rangle$$

Dual-polarimetric Pol-InSAR data

MASTER DATADIR

- config.txt
- sxx.bin, sxy.bin
- sxx.bin.hdr, sxy.bin.hdr
- mask_valid_pixels.xxx

SLAVE DATADIR

- config.txt
- sxx.bin, sxy.bin
- sxx.bin.hdr, sxy.bin.hdr
- flat_earth.bin, kz.bin
- mask_valid_pixels.xxx

MASTER DATADIR_SLAVE DATADIR

- **T4**
  - config.txt
  - T11.bin,
    T12_real.bin, T12_imag.bin,
    T13_real.bin, T13_imag.bin,
    T14_real.bin, T14_imag.bin,
    T22.bin,
    T23_real.bin, T23_imag.bin,
    T24_real.bin, T24_imag.bin,
    T33.bin,
    T34_real.bin, T34_imag.bin,
    T44.bin.
  - Txx.bin.hdr,
    Txy_real.bin.hdr, Txy_imag.bin.hdr…
  - mask_valid_pixels.xxx

Input Directory

DATADIR

T3

config.txt

[T3x3] Elements (.bin)

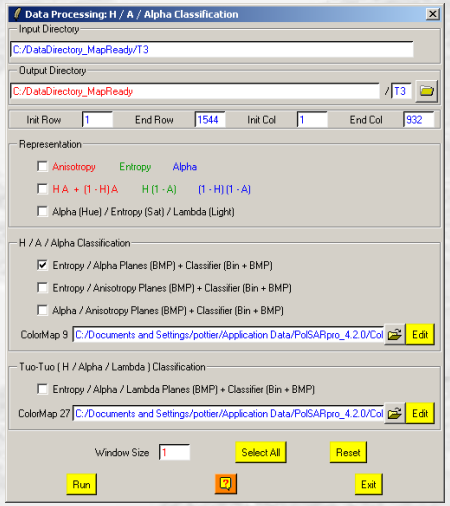
[T3x3] Elements (.bin.hdr)

mask_valid_pixels.bin

mask_valid_pixels.bin.hdr

mask_valid_pixels.bmp

mask_valid_pixels.bmp.hdr



PolSARpro Data Processing Functionnality

Output Directory

DATADIR

T3

config.txt

[T3x3] Elements (.bin)

[T3x3] Elements (.bin.hdr)

mask_valid_pixels.bin

mask_valid_pixels.bin.hdr

mask_valid_pixels.bmp

mask_valid_pixels.bmp.hdr

OutputDataFile.bin

OutputDataFile.bin.hdr

OutputDataFile.bmp

OutputDataFile.bmp.hdr

Questions ?