



PIC : IMPLEMENTATION AND STRUCTURE



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PIC 1.0.0

STRUCTURE AND CONTENT

DELIVERED TO PLATO
COLLABORATION May 7, 2019





PIC 1.0.0 STRUCTURE

TABLES

- PICtarget1.0.0
- PICtargetReferences1.0.0

DOCUMENTATION

- Scientific Note (WP13)
PLATO-SCI-UPD-TN-015
- Delivery Note (WP34)
PLATO-SSDC-PDC-TN-0001



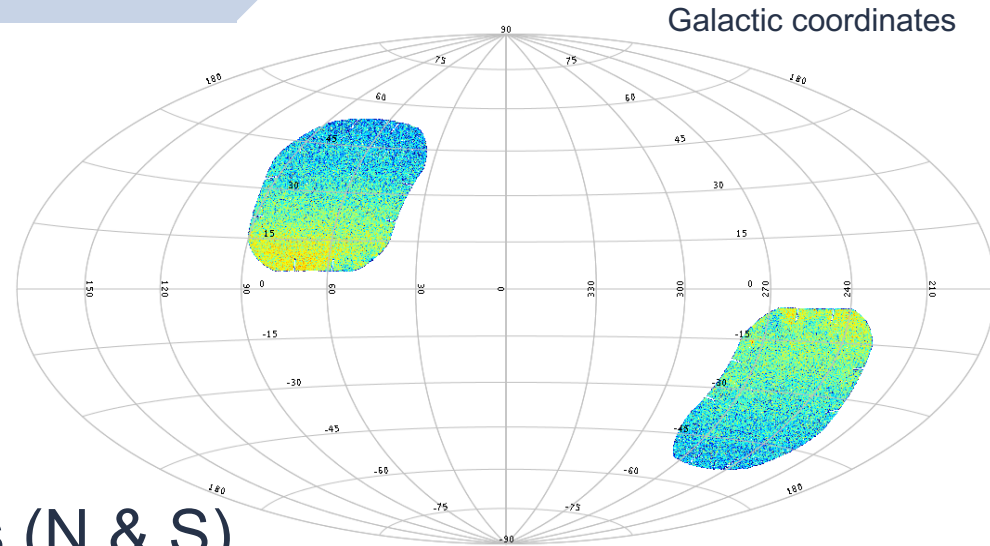
PIC 1.0.0 CONTENT

■ P1 P2 P5

■ Nominal long-duration fields (N & S)

■ North : $l = 65$, $b = +30$

■ South : $l = 253$, $b = -30$





PIC 1.0.0 CONTENT

Astrometry

Photometry

Astrophysical
parameters

Contamination

NSR
Camera
NOBS
NSAT

future PICs

STRUCTURE AND CONTENT

BASELINE



future PICs STRUCTURE

TABLES

- **PICtarget**N1.N2.N3
- **PICtargetReferences**N1.N2.N3
- **PICtargetSourceId**N1.N2.N3
- **PICcontaminant**N1.N2.N3
- **PICcontaminantReference**N1.N2.N3
- **PICcontaminantSourceId**N1.N2.N3

DOCUMENTATION

- Scientific Note (WP13)
- Delivery Note (WP34)

Original source identifiers for all catalogues used to select and/or characterize the targets or contaminants.



future PICs STRUCTURE

TABLES

- **PICtargetN1.N2.N3**
 - Target ID + **Target Name** + characterization
 - Reference for each target and each column
 - Additional source IDs (Input Catalogues)
- **PICtargetReferencesN1.N2.N3**
- **PICtargetSourceIdN1.N2.N3**
- **PICcontaminantN1.N2.N3**
 - **Contaminant ID + Name** + target ID and name + characterization
 - Reference for each contaminant and each column
 - Additional source IDs (Input Catalogues)
- **PICcontaminantReferenceN1.N2.N3**
- **PICcontaminantSourceIdN1.N2.N3**



future PICs STRUCTURE

- Target ID == Number
- Target Name == “PIC DRx” + Number

- Contaminant ID == Number
- Contaminant Name == “Contaminants DRx” + Number



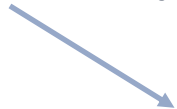
future PICs CONTENT

- P1 P2 P4 P5

- Sky coverage :

- Long-duration fields (North and South)

- All Sky (naming convention: asPIC N1.N2.N3)



Separate tables for fields and allSky

PIC 1.1.0

STRUCTURE AND CONTENT

PLANNED DELIVERY :
DECEMBER 2019



PIC 1.1.0 STRUCTURE

DOCUMENTATION

- Scientific Note (WP13)
- Delivery Note (WP34)

TABLES

- PICtarget1.1.0
- PICtargetReference1.1.0
- PICtargetSourceId1.1.0
- PICcontaminant1.1.0
- PICcontaminantReference1.1.0
- PICcontaminantSourceId1.1.0

Targets :
Gaia DR2 + 2MASS + PanSTARRS1 DR1

Contaminants : Gaia DR2

← NOT included



PIC TARGET 1.1.0 CONTENT

■ P1 P2 P4 P5

■ Long-duration fields
(North and South)

Astrometry

Photometry

Astrophysical
parameters

Contamination

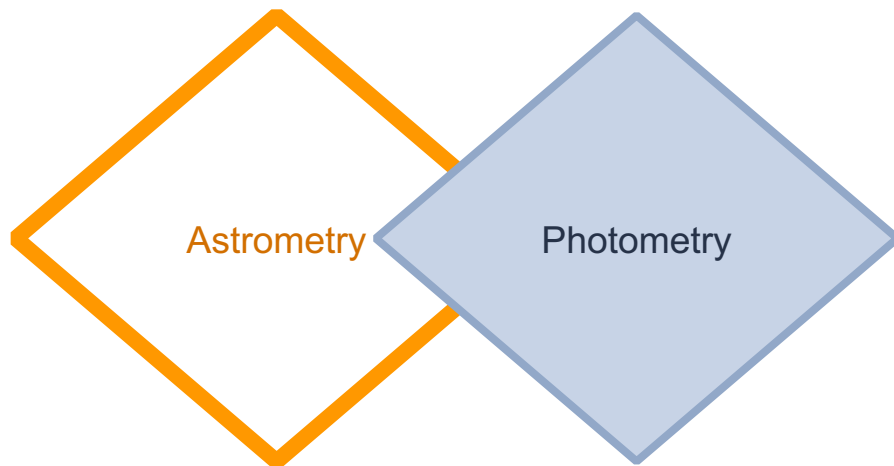
NSR
Camera
NOBS
NSAT



PIC **CONTAMINANT** 1.1.0 CONTENT

■ **P1 P2 P4 P5**

■ Long-duration fields
(North and South)

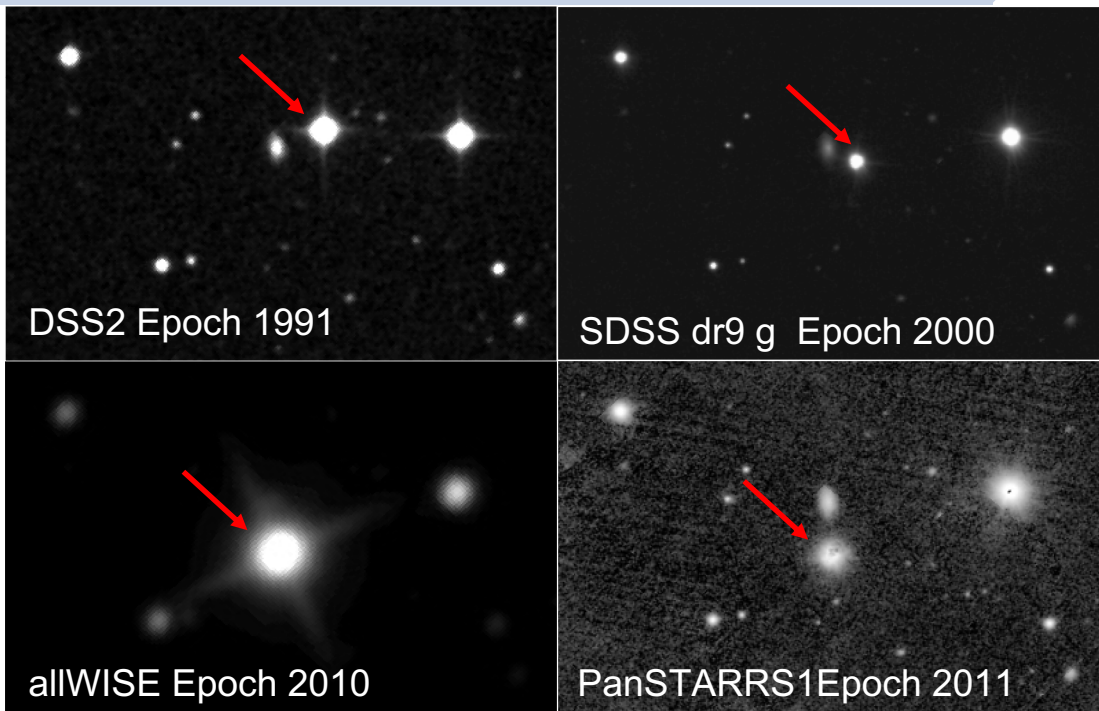




PIC **CONTAMINANTS** : BEWARE OF STELLAR MOTIONS



Gaia DR2 76868614540049408



Horizontal size ~4 arcmin

Aladin CDS

EXTREME CASE
(for illustration purposes)

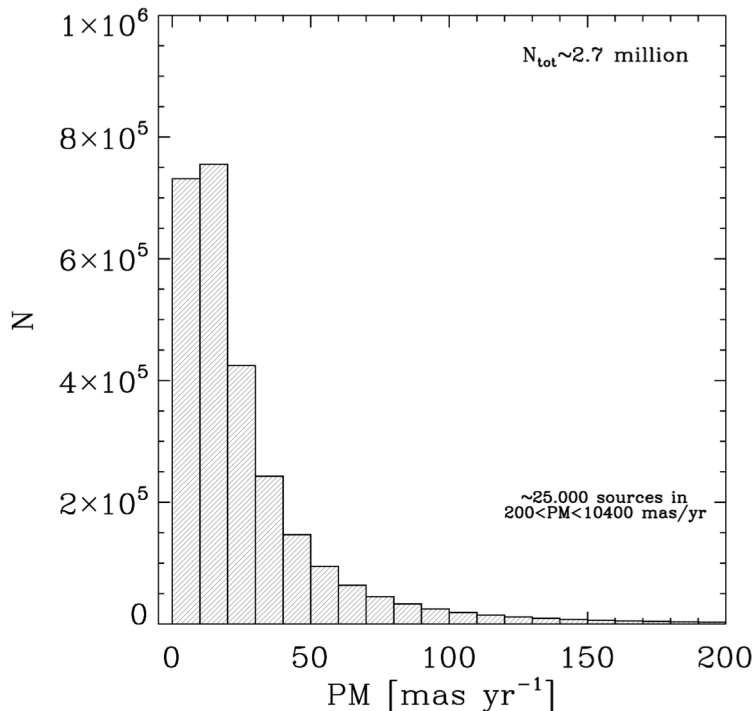
$PM_{\text{total}} \sim 2084.587$ mas/year

Stellar motion has TWO effects:

- move target (position update during field observations)
- change contaminants and their contribution to the target flux



PIC **CONTAMINANTS** : BEWARE OF STELLAR MOTIONS



INPUT
REQUIREMENTS
NEEDED!!

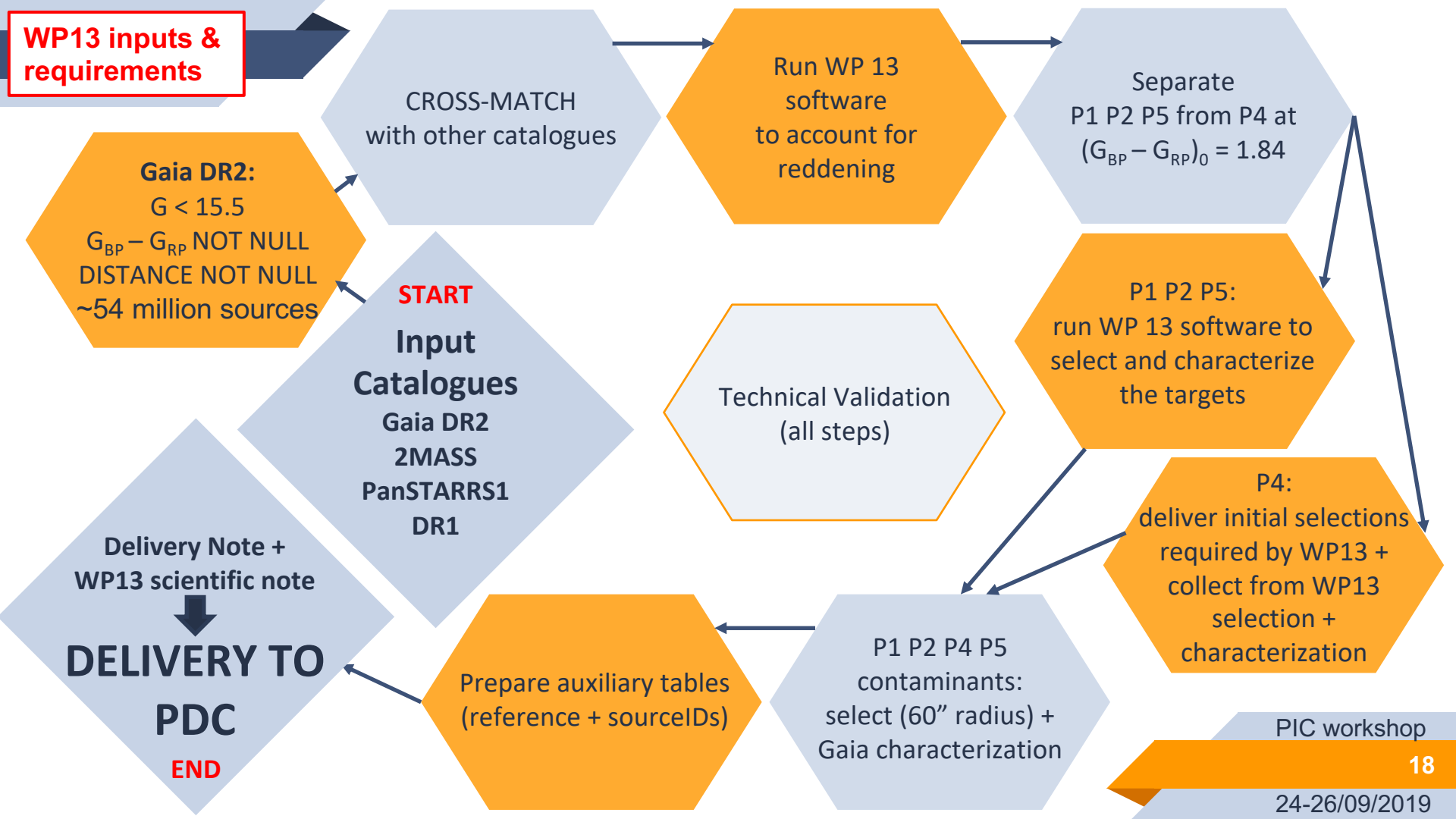
Evaluation of this issue depends on:

- required accuracy on target position for data acquisition
- required accuracy on contaminant positions with respect to the target

PIC 1.1.0

IMPLEMENTATION

WP13 inputs & requirements





LARGE INPUT CATALOGUES XM

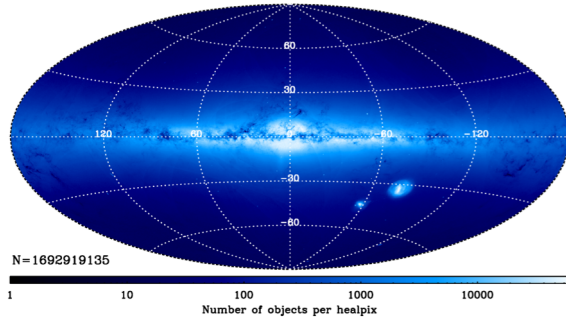
1 Gaia DR2
1 692 919 135

XM updated

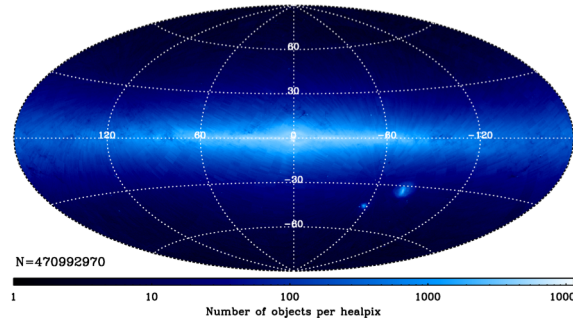
2 2MASS PSC
470 992 970

3 PanSTARRS1 DR1
2 264 263 282

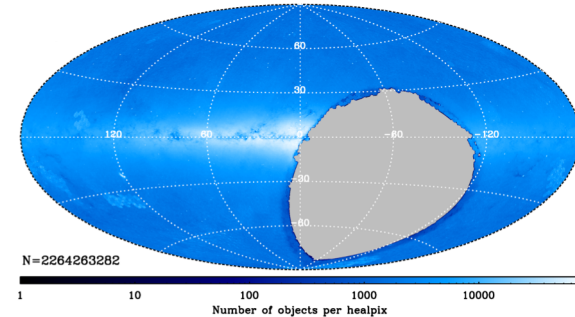
Gaia DR2



2MASS



Pan-STARRS1



+ Bailer-Jones 2018 (distances)

+ XM with Gaia DR2

PLATO-SSDC-PDC-TN-0004 (draft)

Marrese et al. 2017, A&A, 607, 105

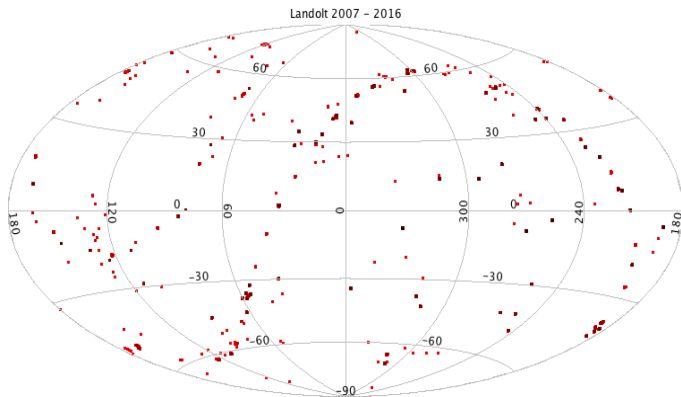
Marrese et al. 2019, A&A, 621, 144



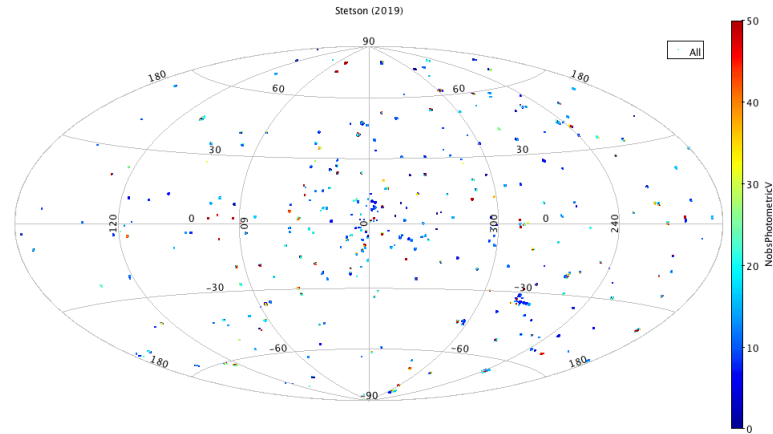
STANDARD STARS CATALOGUES

3 Henry 2018 (RECONS) **397**
(K&M dwarfs only)

- 1** Landolt & Uomoto (2007) **31**
Landolt (2007) **128**
Landolt (2009) **595**
Landolt (2013) **349**
Clem & Landolt (2013) **43587**
Bohlin & Landolt (2015) **2**
Clem & Landolt (2016) **2125**



2 Stetson (2019) **177 915**



Standards + XM with Gaia DR2
PLATO-SSDC-PDC-TN-0002 (draft)



M DWARFS CATALOGUES

Ahmed (2019)
Kiman et al. (2019)
Morrell (2019)
Rabus (2019)
Stassun (2019) CTL v8
Henry (2018) RECONS
Theissen (2016)
Gaidos (2014)
Lepine (2011)
West (2011)

CARMENES input catalogue of M dwarfs.
I Alonso-Floriano (2015)
II Cortes-Contreras (2017)
III Jeffers (2018)
IV Diez Alonso (2019)

Passegger (2019)

M dwarfs catalogues + XM with Gaia DR2
PLATO-SSDC-PDC-TN-0003 (draft)