Initial Gaia Source List 2

Best all sky positions and magnitudes today

XXXX objects XXXX XXXXX

Being extracted for delivery OATo -> ESAC

Next Delivery OATo -> DPCT -> ESAC

Still not clear charge-transfer history requirement

Changes to IGSL1

- Added SDSS to r=24
- Added 2MASS
- Galactic and Ecliptic coordinates (selection)
- Booleans:
  - toggleASC = Attitude Star Catalog toggle
  - auxRadVel = RV flag (dynamic??)
  - auxParallax = Pi flag (perhaps more than 0/1)
  - aux GSC23/SDSS/UCAC/LQRF/TYCHO/TMASS

Attitude Star Catalog toggle

- Objective
  - 75 Stars / sq degree
- Selection criteria
  - G < 13.0 in plane (b < 20)
  - G < 13.6 – 14.2 out of plane
  - Classified as star, e.g. not blended
- Current realization
  - Median, high, low….

A new IGSL during mission ?

Hopefully this will not be required, however an example is deep large survey that will help the CTE, so even if it is an outside possibility it must be planned for.

Points:

- IDs must be consistent
- So just add objects not in the GAIA sky
- How?
  - a fake observation in the IDT chain
  - MDB Integrator
  - IDU XM

Needs to be discussed for the ramifications

IGSL relation to External Catalogs

Examples: CU6 RV list, HIPPARCOS, Stars with Pi

- Keep number of Aux. Catlogs to a minimum
- In MDB/CU3/Auxdat section
- Responsibility of respective CUs
- IGSL SourceId required (using CU1 IGSL XM)
- A dynamic boolean flag for aux. catalogs (possible?)

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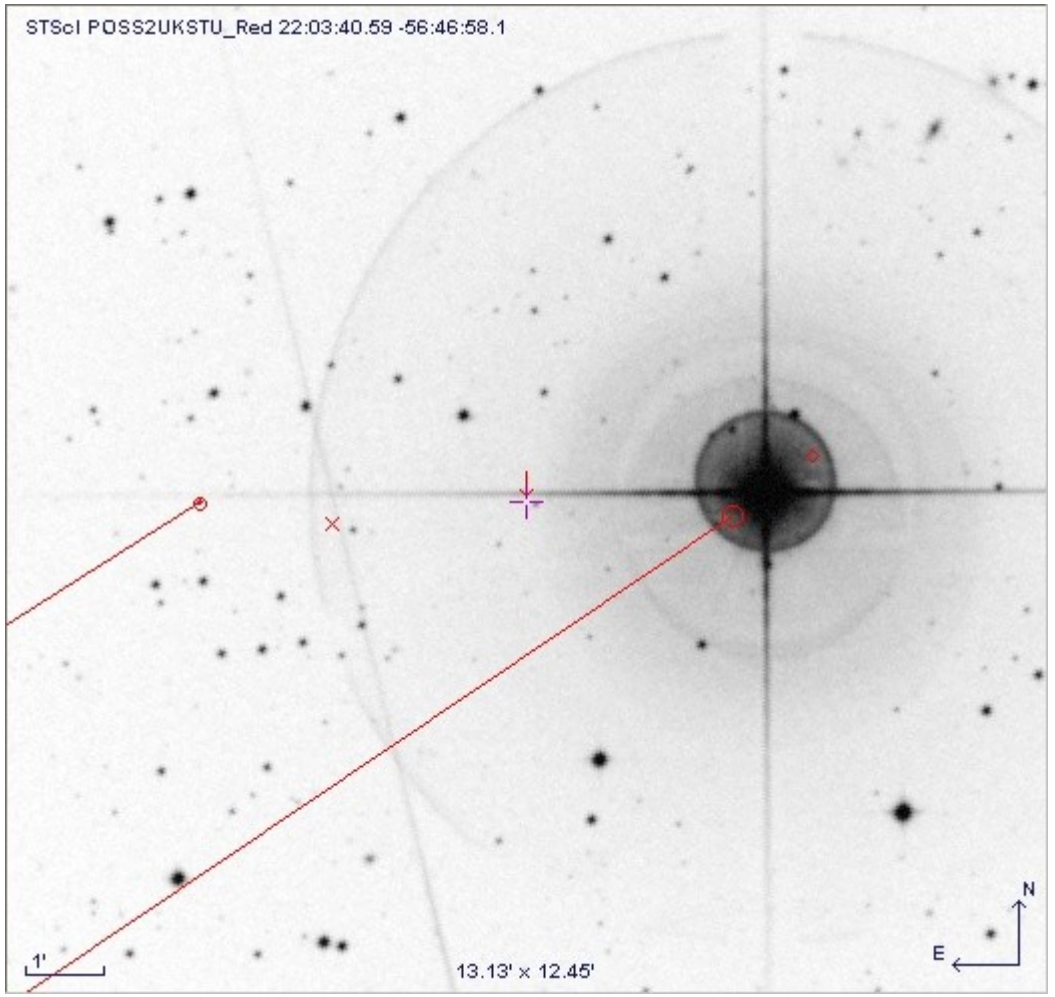
IGSL New Role

GAIA-C3-TN-ARI-BAS-033-01: “The starting source list for IDT will be the Initial Gaia Source List (IGSL), i.e. a pre-launch, ground-based optical/near-IR sky survey. The obvious alternative, viz. an initially empty source list, has been discarded on purely practical reasons.”

- Importance (dare we say MC)
- Requirements required
- Role in IDU not clear
- Possible problems (dare we say mission bias)

Possible Problems (not exhaustive)



- HPM Objects leaves multiple GSC entries

- Faint Companion, closest T1 to us, probably **not** in GAIA (r=20.8)

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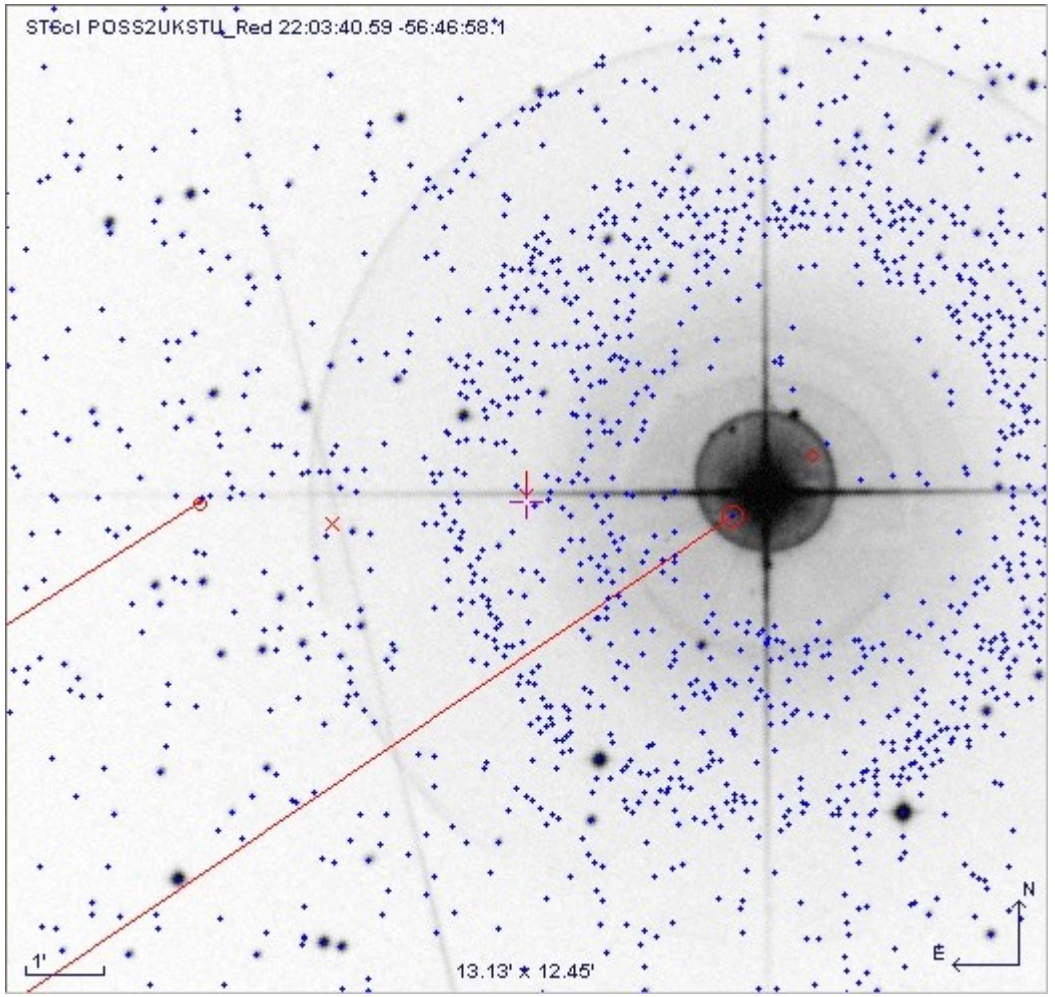

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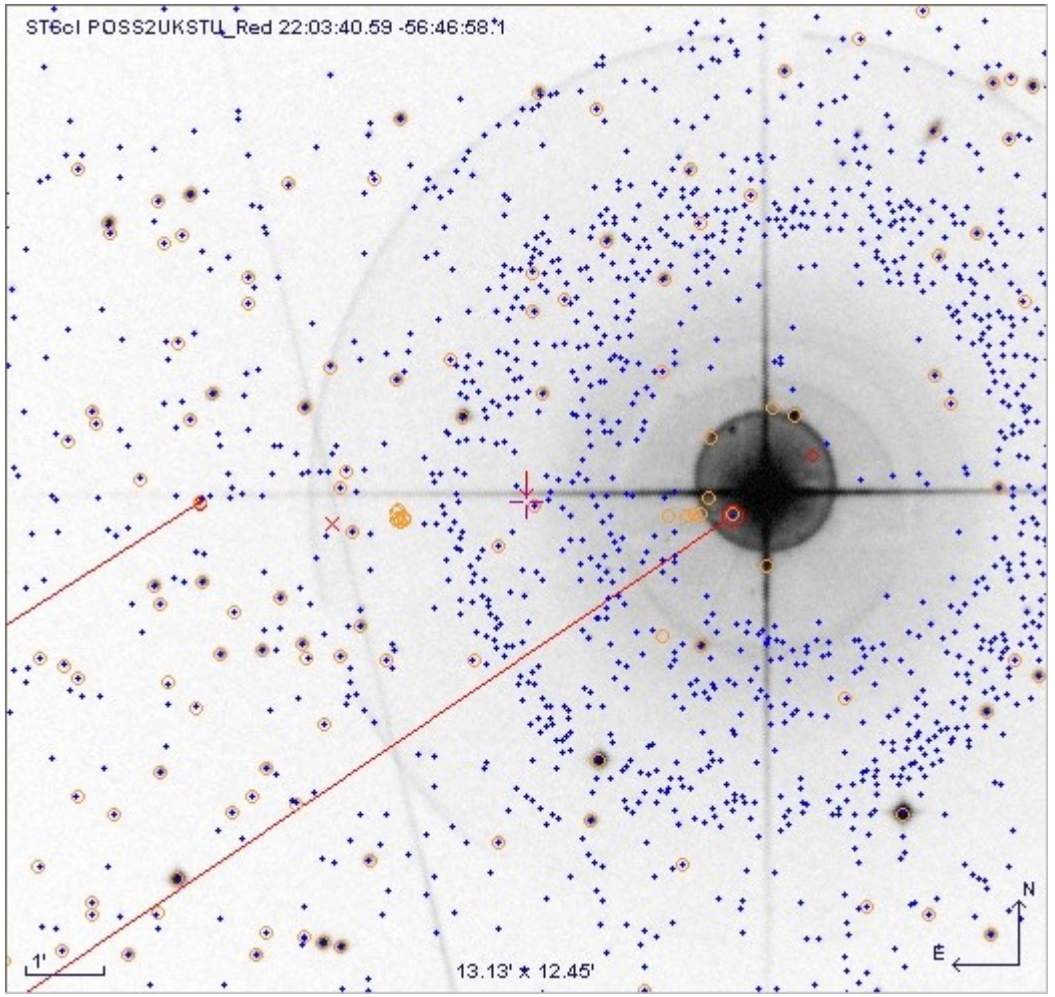
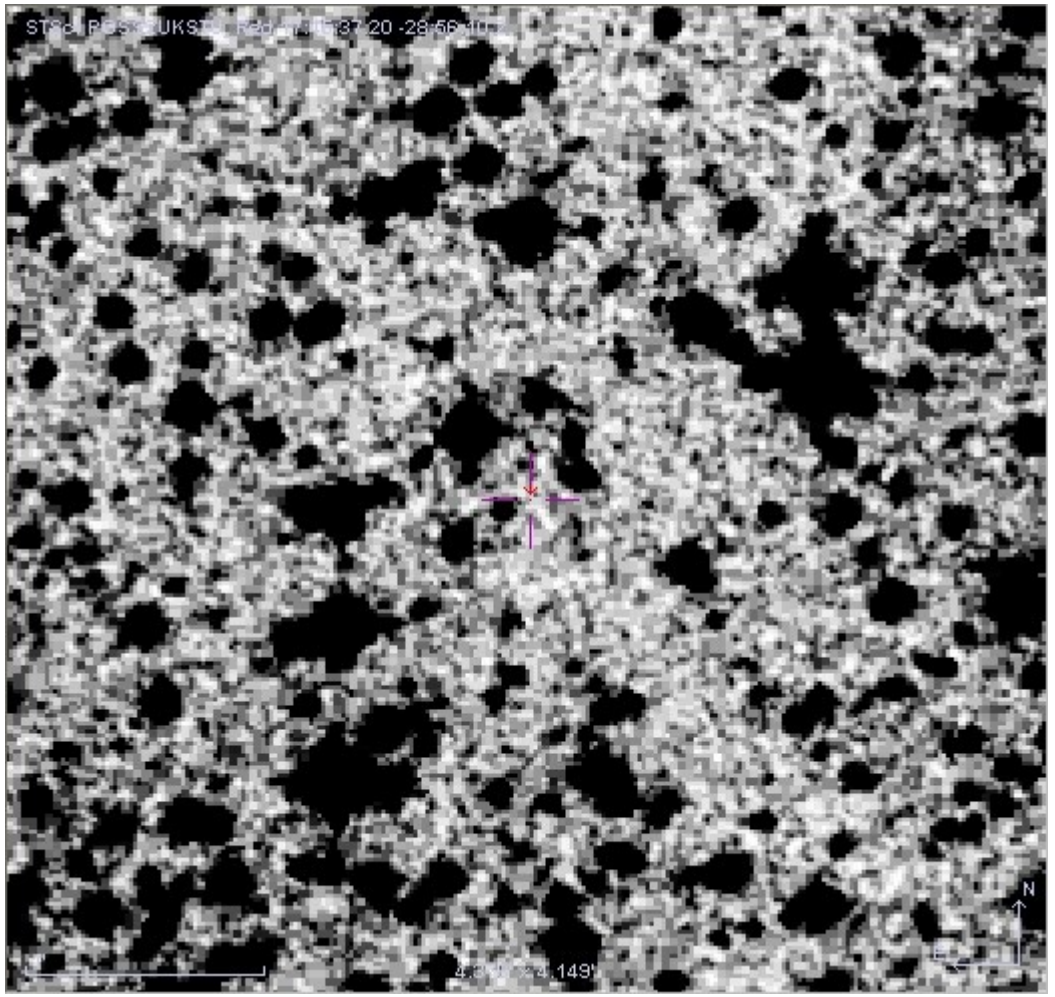


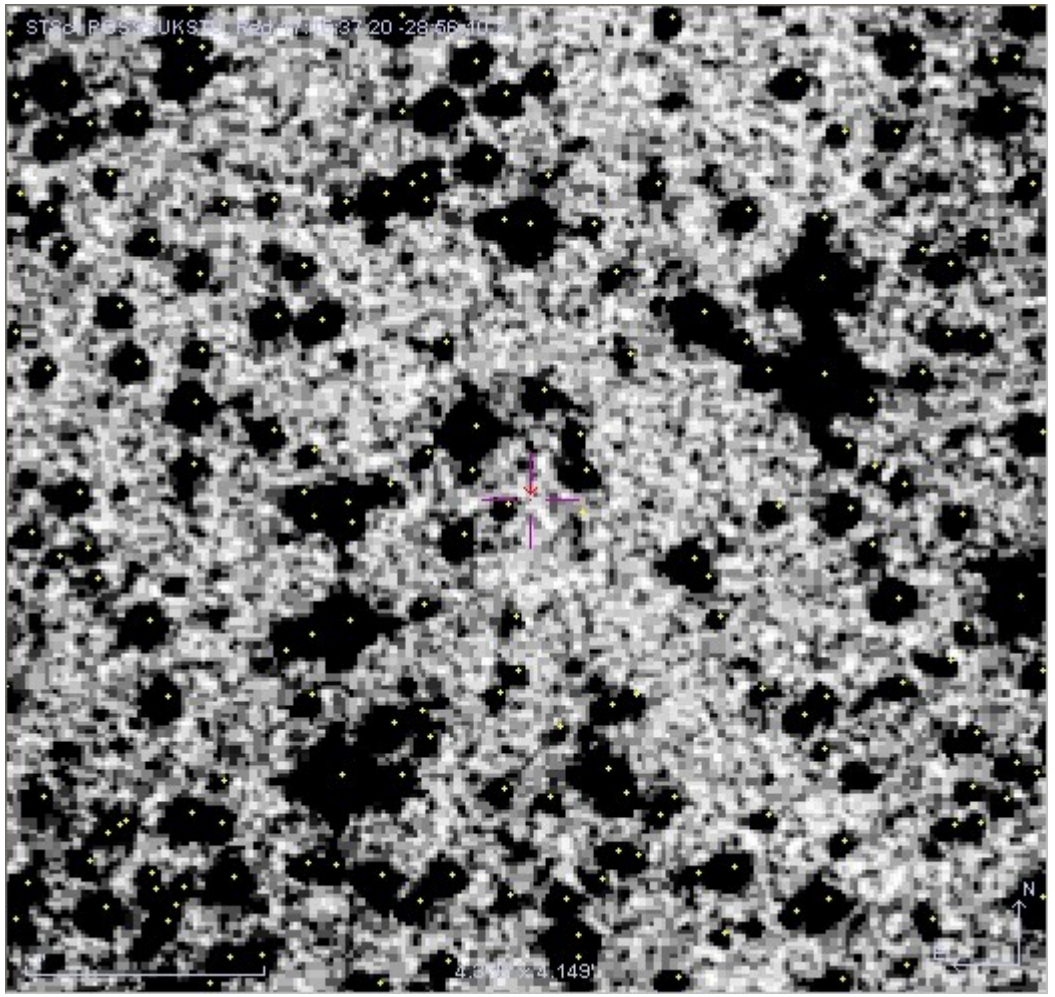
- HPM Objects leaves multiple GSC entries
- Faint Companion, closest T1 to us, probably **not** in GAIA (r=20.8)
- GSC noise around bright star
- 2MASS has other noise

Possible Problems 2 (not exhaustive)



- 90% of objects in plane and most blends
- most IGSL names to be superseeded
- GSC complete to 18

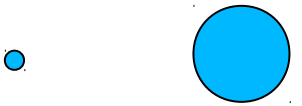
Possible Problems 2 (not exhaustive)



- 90% of objects in plane and most blends
- most IGSL names to be superseeded
- GSC complete to 18
- circles an estimate of the search radius when complete to 20

Gaia vs

Gaia IGSL

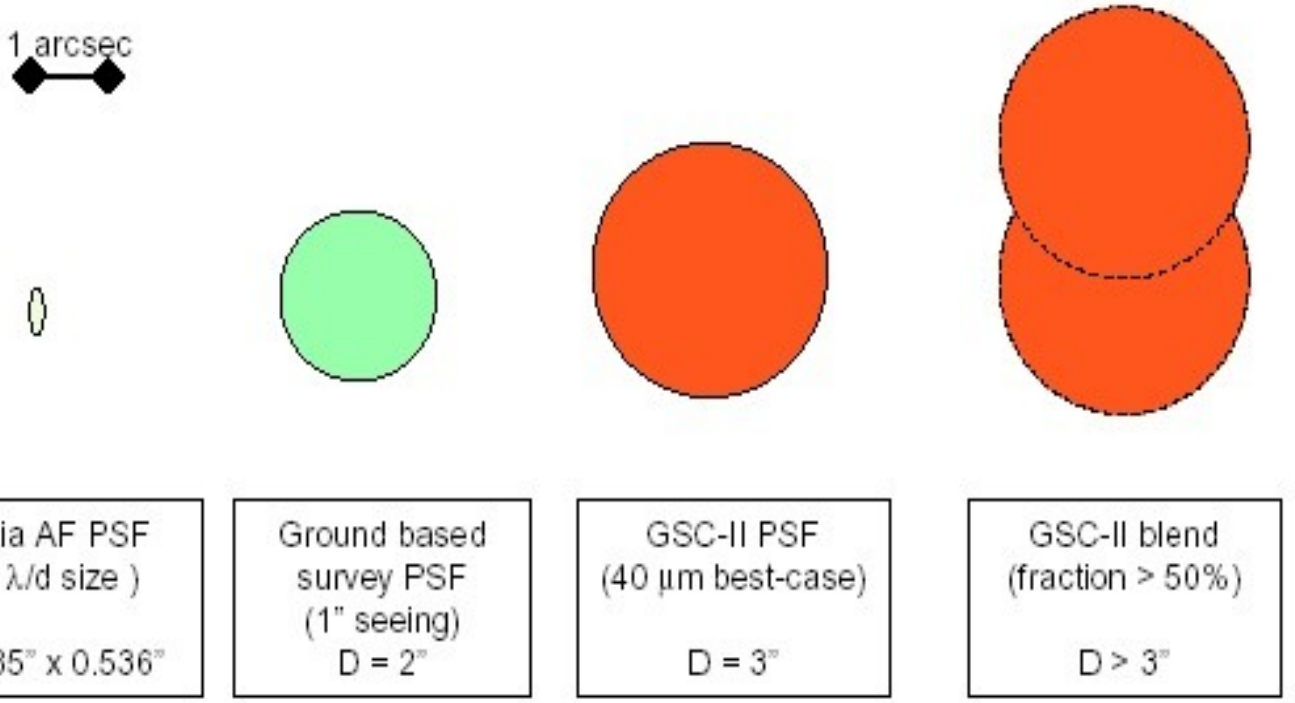


Possible Problems (not exhaustive)

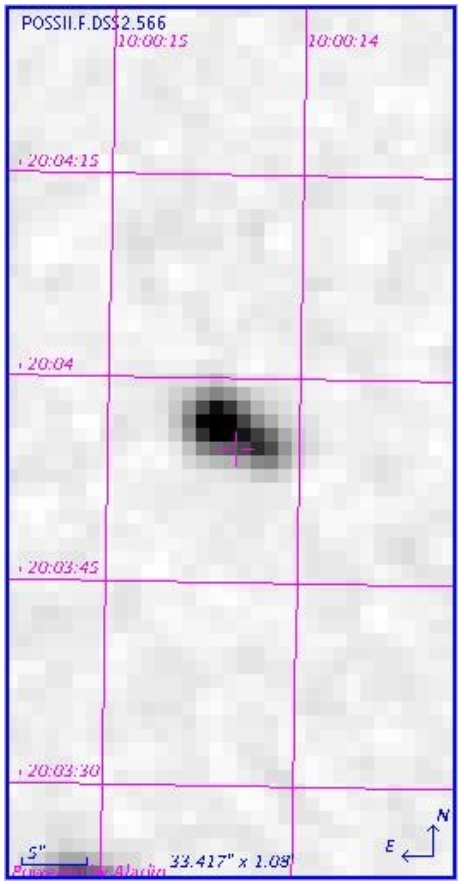
Initial Gaia Source List 01/2008

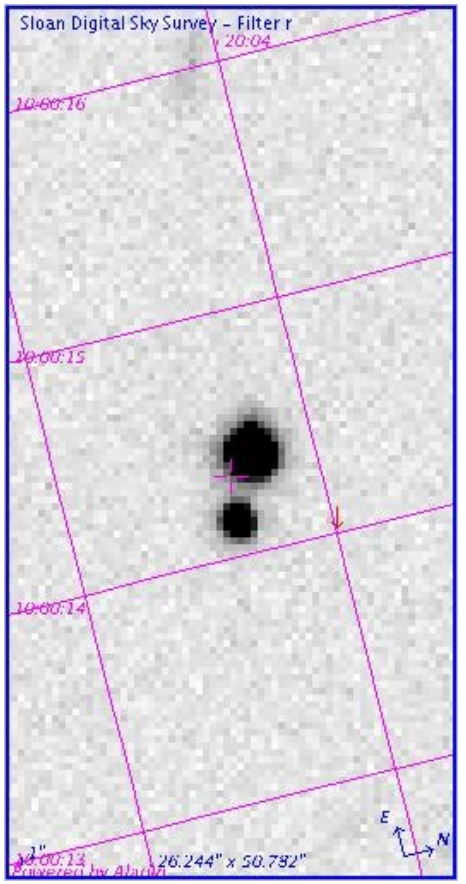
- Act as a base for the matching of GAIA observations
- Provide an early base from which to recognize science alerts such as SNs, Solar System objects, novae and other large variables, etc
- Allow a pre-matching of the numerous auxiliary catalogs (reference catalogs from all CUs) to the provisional GAIA object names;
- This pre-matching will clean and homogenize the auxiliary data and allow us to minimize and investigate mismatches before launch
- Simplify the software development and act as a sanity check during the mission especially First Look;
- Provide cross reference material for GAIA uses such as multi band magnitudes and data mining;
- Allow transit predictions for the purpose of charge-transfer history tracking, especially early in the mission when the Gaia
- A subset of the IGSL will form the Attitude Star Catalog

Matching – The devil's in the details

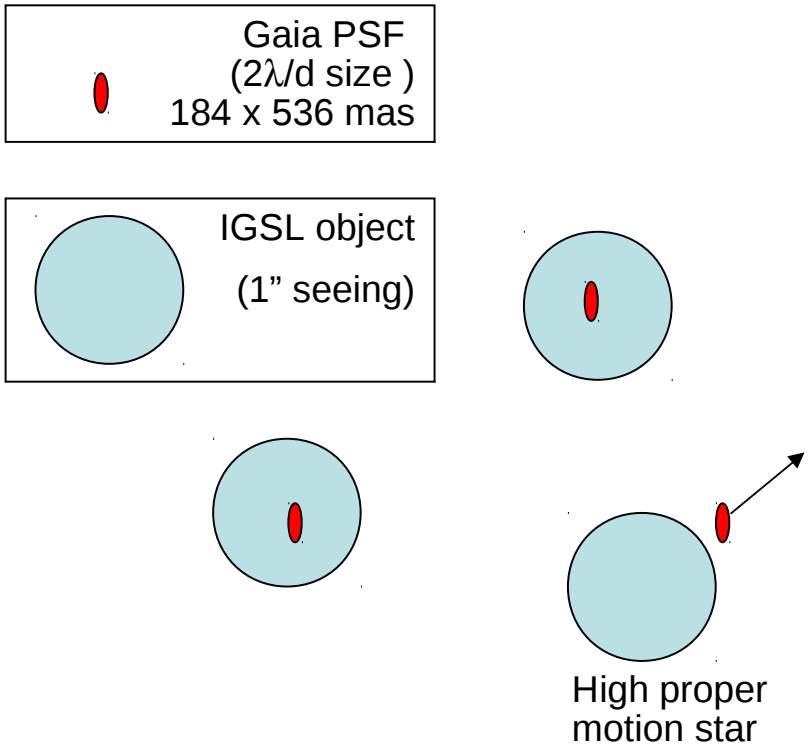


GSC23 vs SDSS



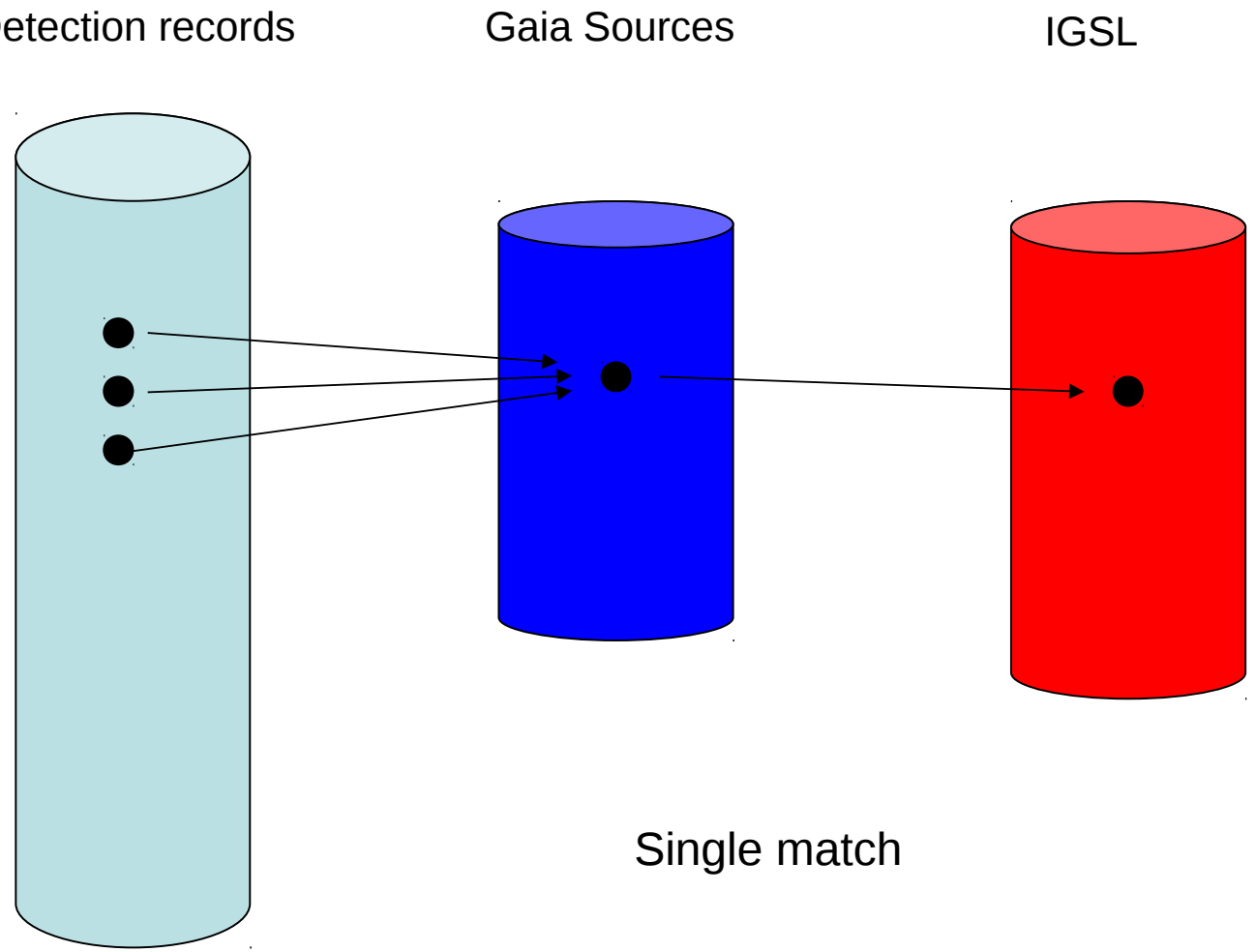


IGSL vs Gaia Obs



Catalogs with very different properties in terms of :

- **Resolution**
- **Observation Epoch** (proper motions, variability)
- **Passbands**

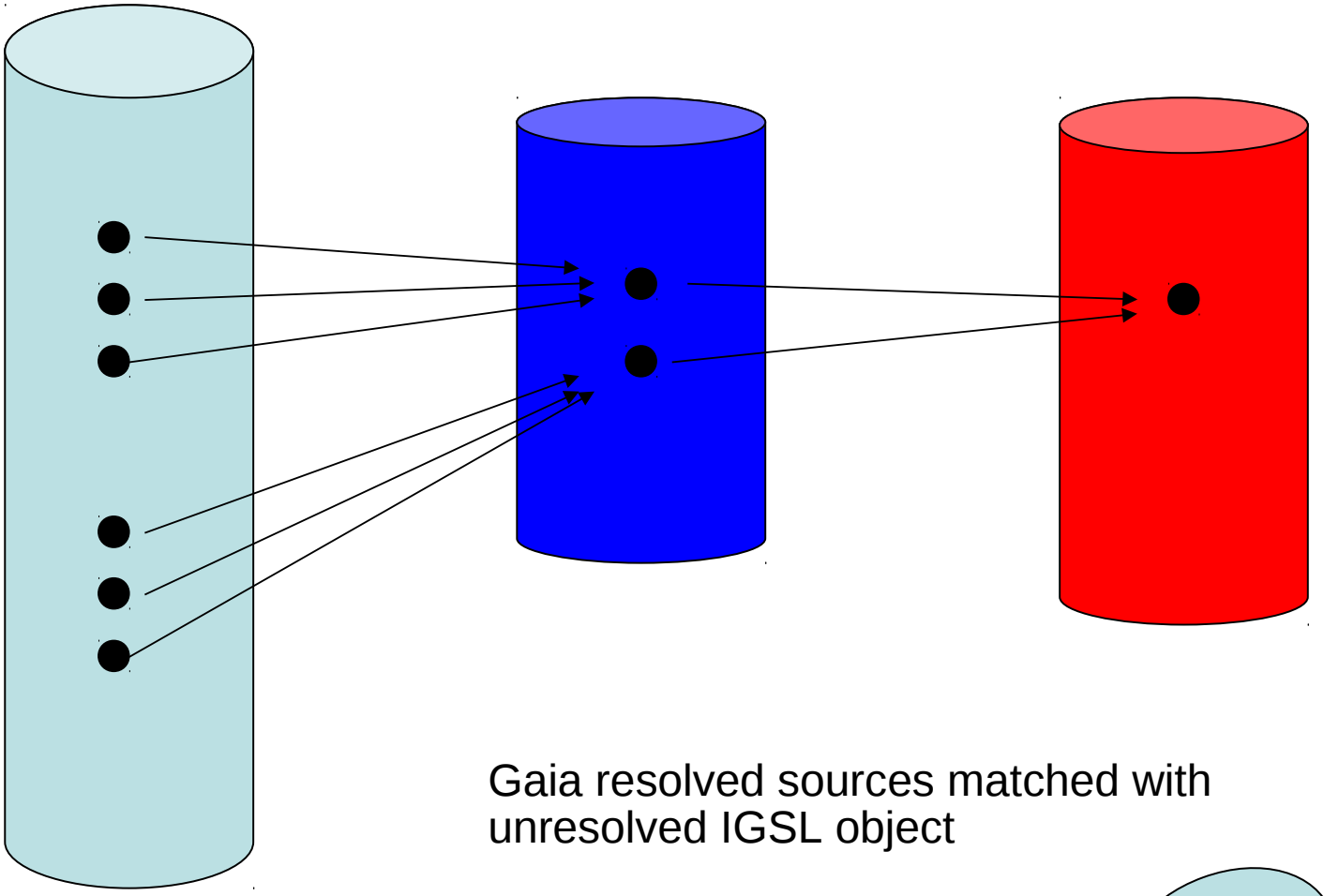


Single match

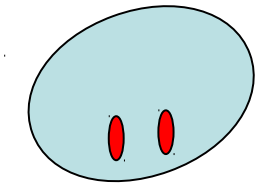
Detection records

Gaia Sources

IGSL



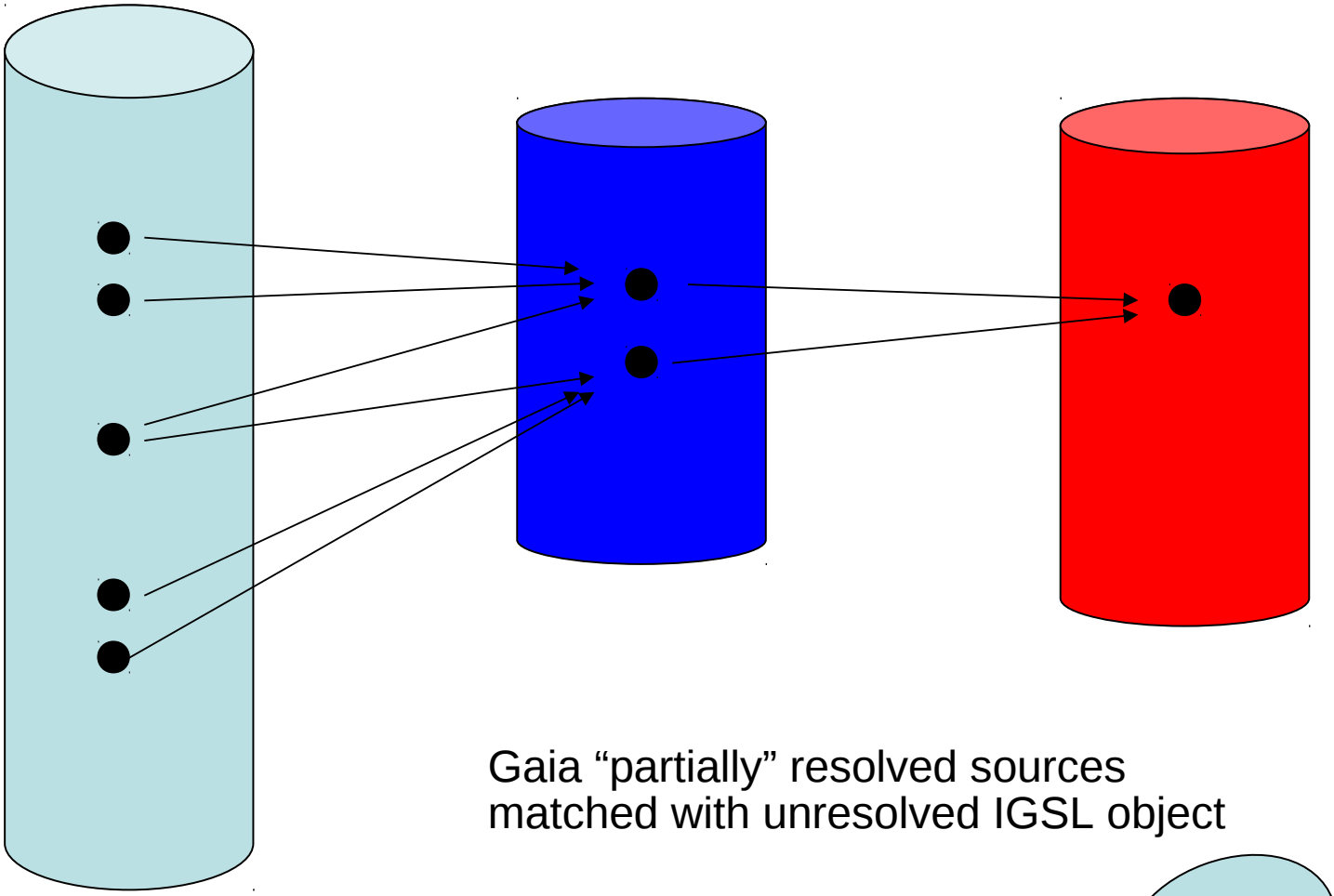
Gaia resolved sources matched with unresolved IGSL object



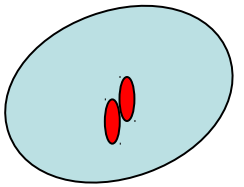
Detection records

Gaia Sources

IGSL



Gaia “partially” resolved sources
matched with unresolved IGSL object



Matching – The devil's in the details

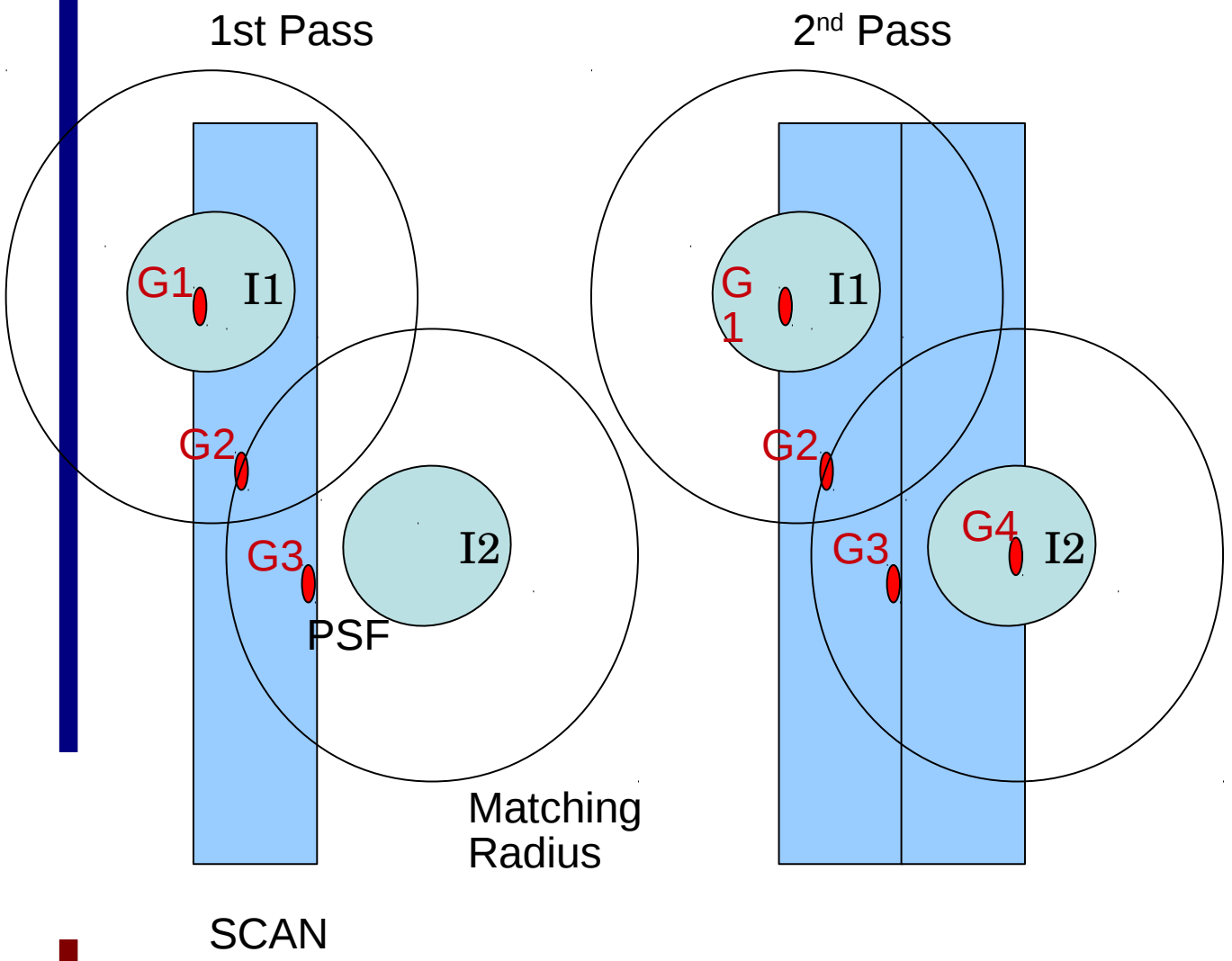
Matching at CU level

- Distribution of efficient matching routines
- Widespread CPU repetition
- Data only with MBD release

Adopting IGSL names

- Extra-confusion due to mis-identifications
- Possible bias of results as parents now 1-3”
- Renaming large -> lookup table large

Matching – The devil's in the details



GAIA NAMING
1st pass G1, G2, G3
=> I1 = G1, I2=G3
2nd pass add G4
=> I1 = G1, I2=G4

IGSL NAMING =>
1st pass
I1 becomes G2/G2/2?
I2 becomes G3/G2/1?
2nd pass
I1 becomes G2/G2/2?
I2 becomes G2/G3/G4/1?

GAIA Naming
2*10^9 names + IGSL link

IGSL Naming
10^9 ~50% blended
> 3*10^9 names

IGSL Progress + Future

- 2007 IGSL 1.0 produced (Tycho/UCAC/SDSS/QSO/GSC)
- 12/2007 Delivered to ESTEC
- 2008 IGSL – Aux Cat Xmatch tool produced

- 11/2008 Xmatch and IGSL 1.0 Assessment
- 05/2009 Attitude Star Catalog subset to ESTEC
- 11/2009 IGSL 2.0 to ESTEC
- 05/2010 Definitive IGSL 3.0 + ASC subset