IVOA InterOp Meeting

Garching, 09/11/09

The Case for Provenance

Juande Santander-Vela, Arancha Delgado
European Southern Observatory, Archive Department

Talk Outline

- What is Provenance?
- How does Provenance fit in the VO?
- The case(s) for Provenance
- Conclusions

What is Provenance?

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provenance |ˈprävənəns|

noun
the place of origin or earliest known history of something *: an orange rug of Iranian provenance.*
• the beginning of something's existence; something's origin *: they try to understand the whole universe, its provenance and fate.*
See note at **origin** .
• a record of ownership of a work of art or an antique, used as a guide to authenticity or quality *: the manuscript has a distinguished provenance.*
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What is Provenance?

- Definition points out to:
  - **History** of astronomical data products
  - **Ownership/Attribution** (Observer, Proposal, Telescope/Instrument)…
  - **Quality**

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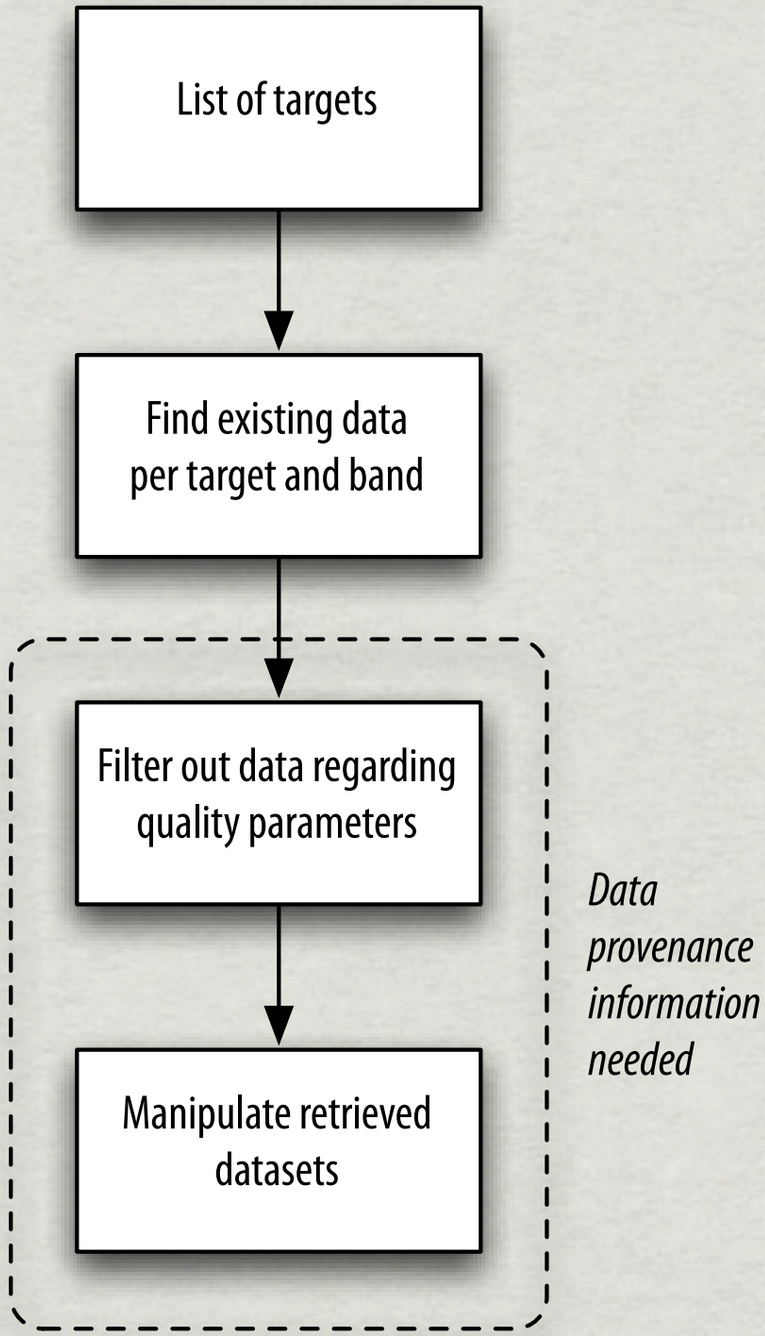
TYPICAL ASTRONOMICAL WORKFLOW



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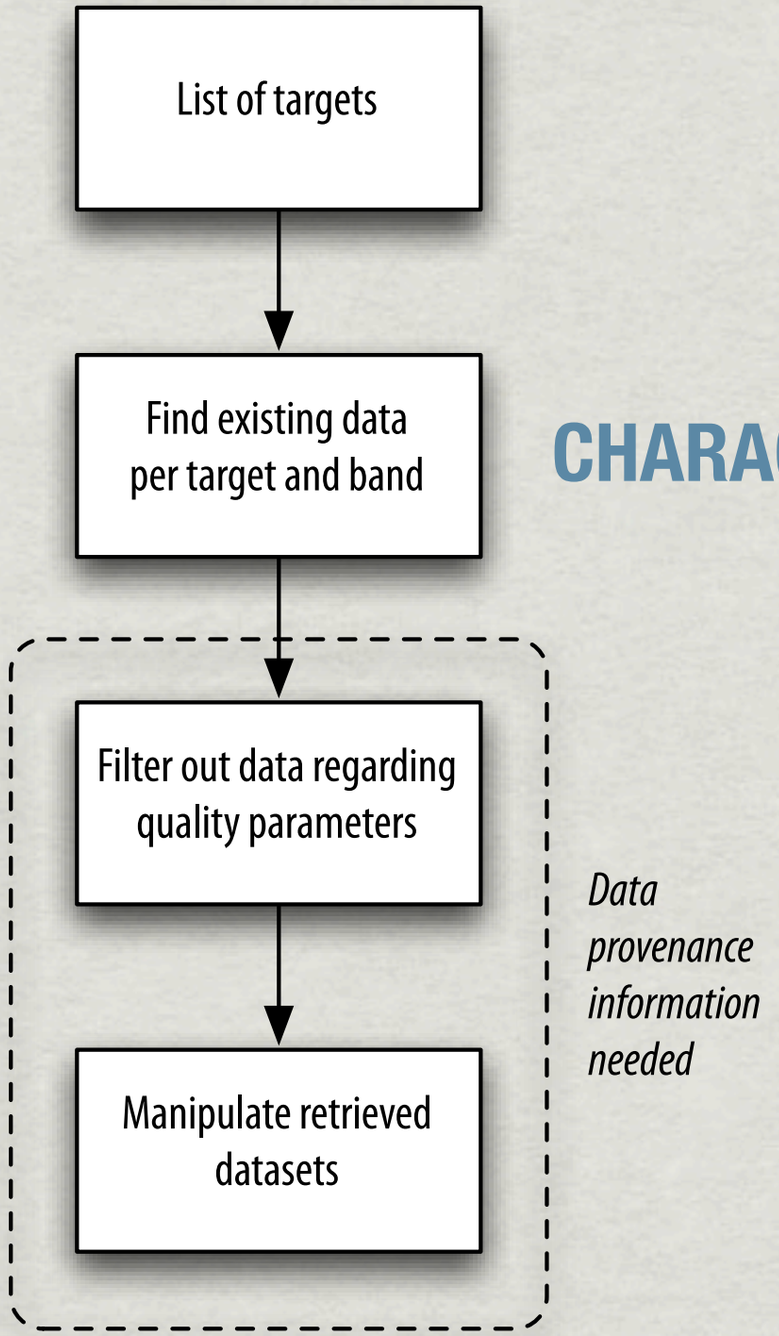

CHARACTERISATION

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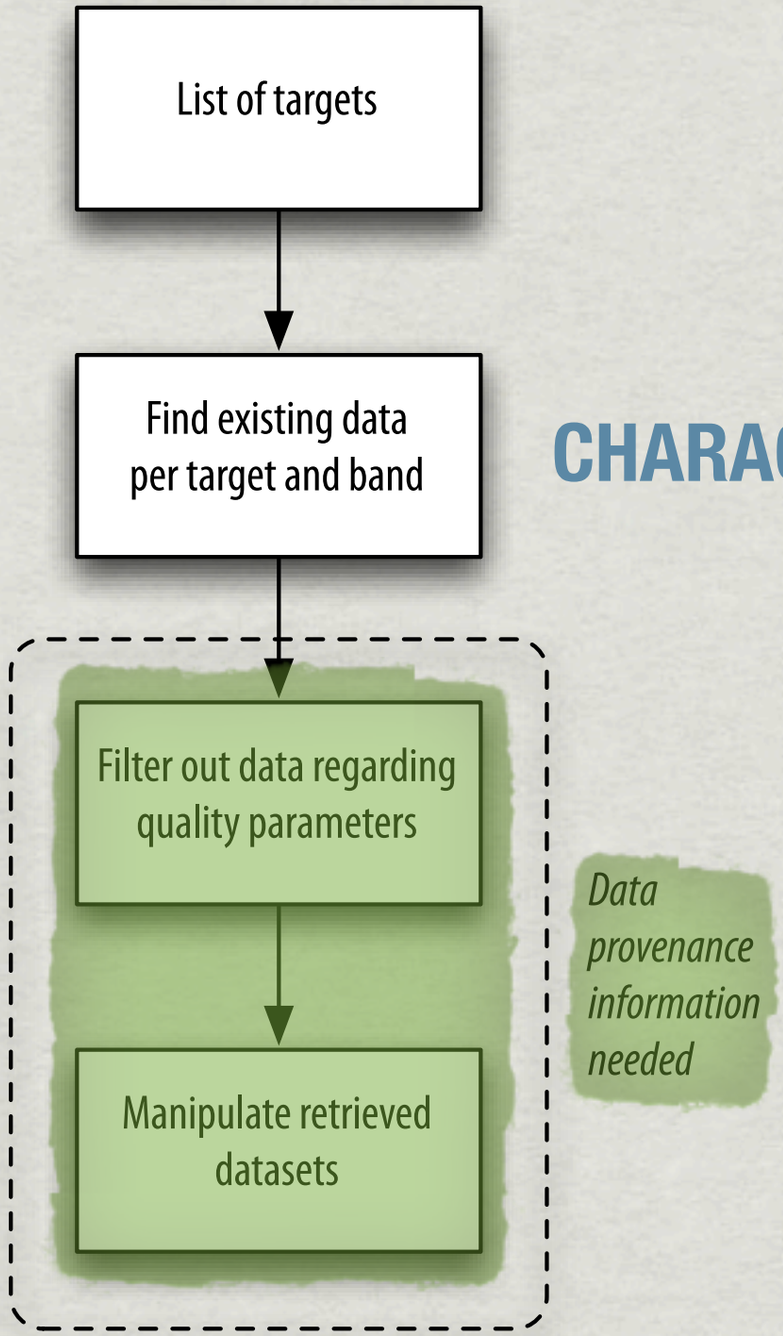

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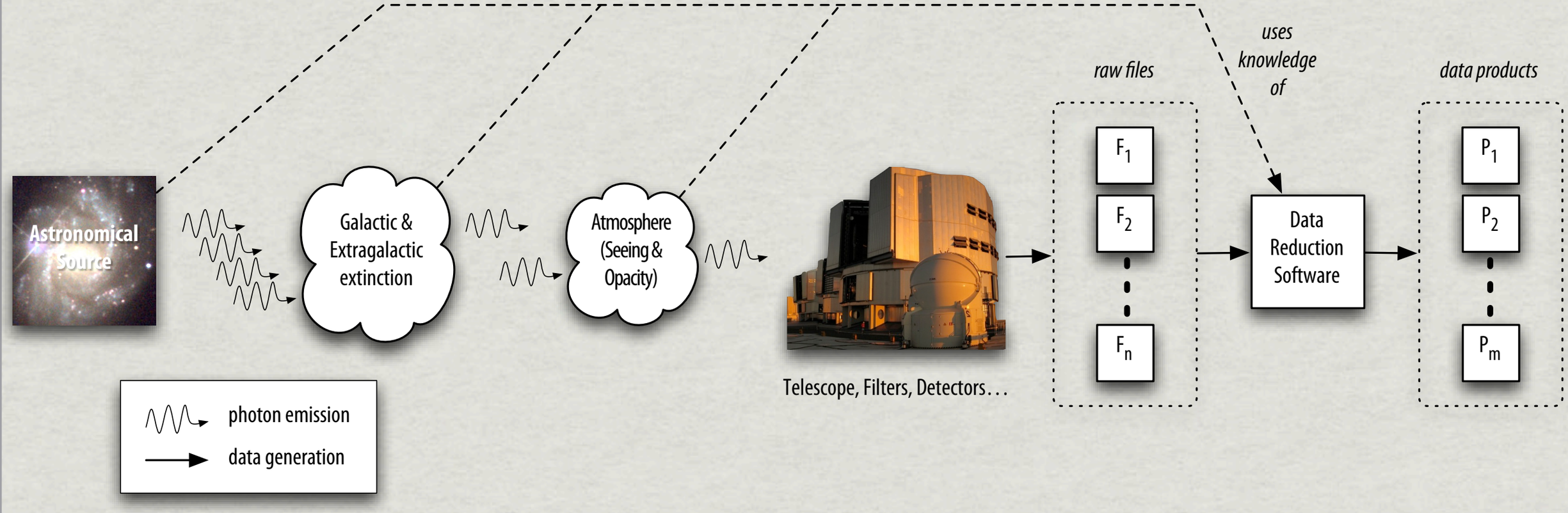

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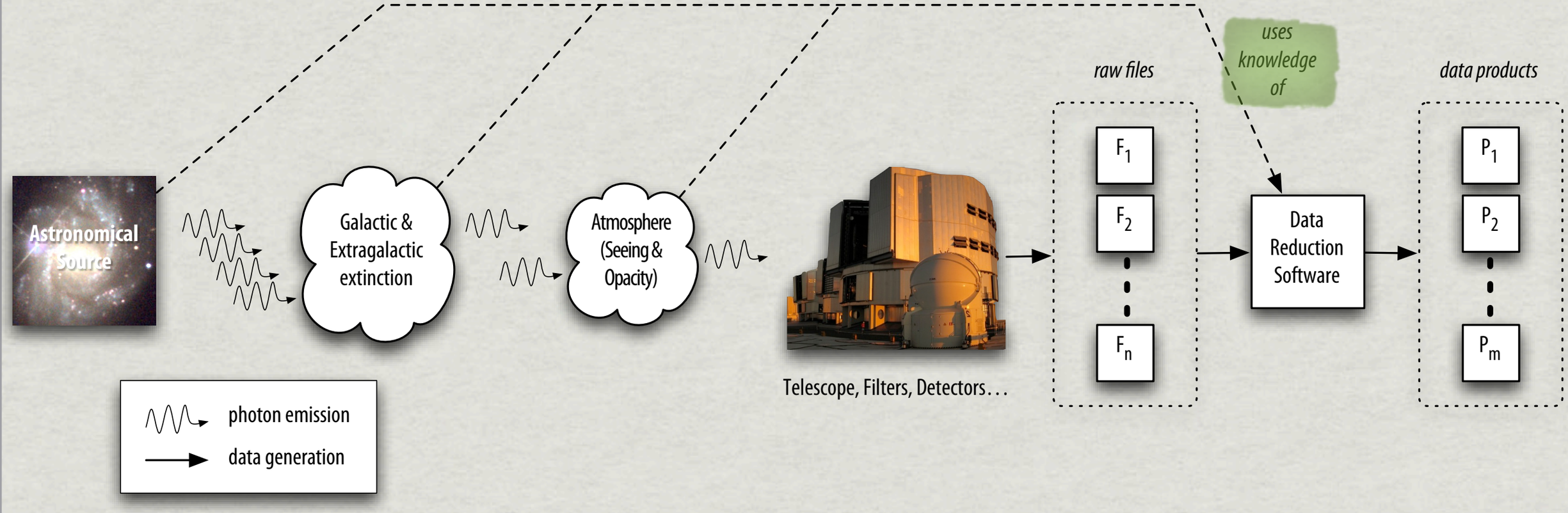

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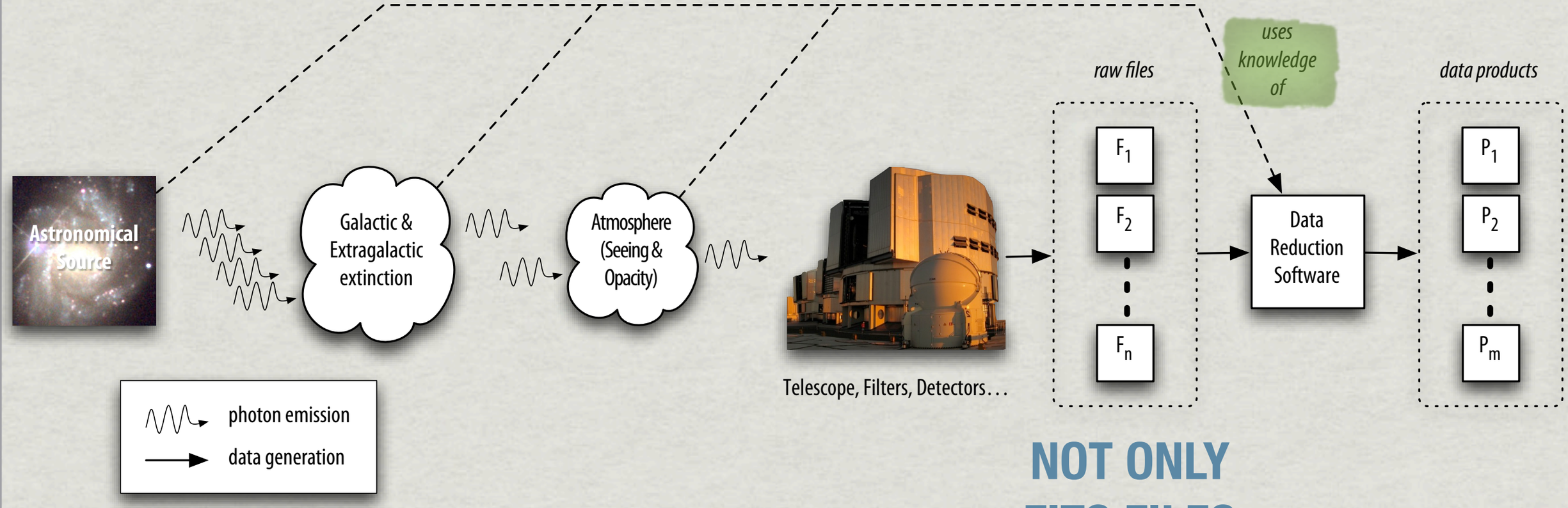

NOT ONLY FITS FILES

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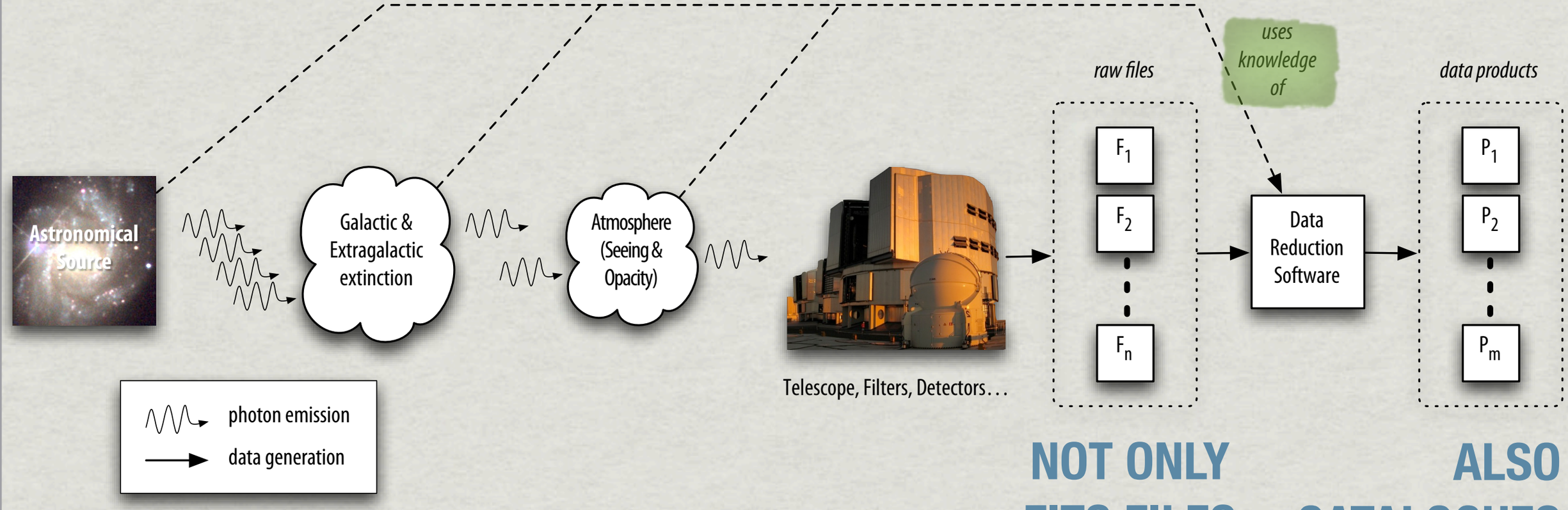

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ALSO CATALOGUES

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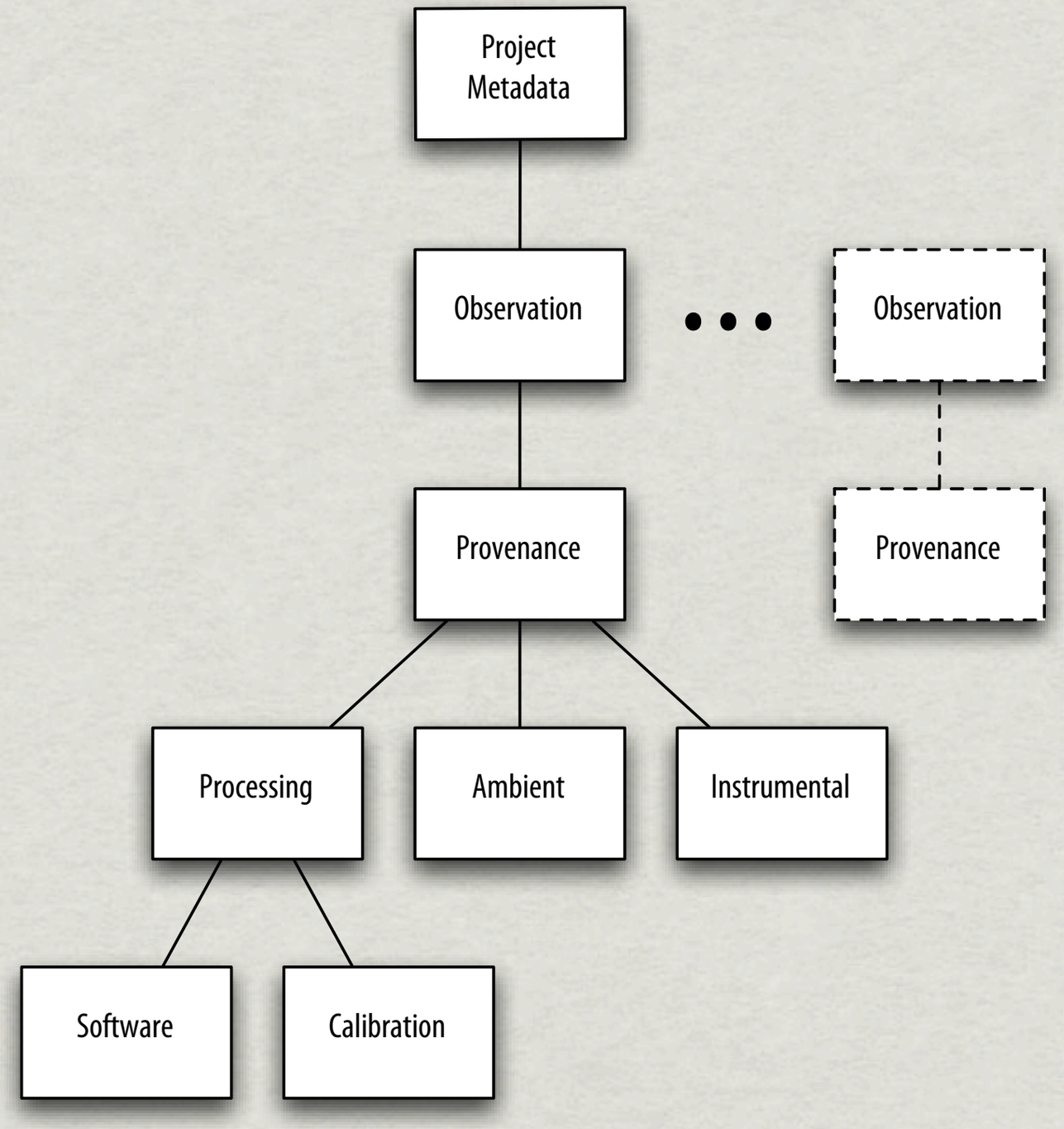

INTERNAL PROVENANCE WHITEPAPER BY N. DELMOTTE

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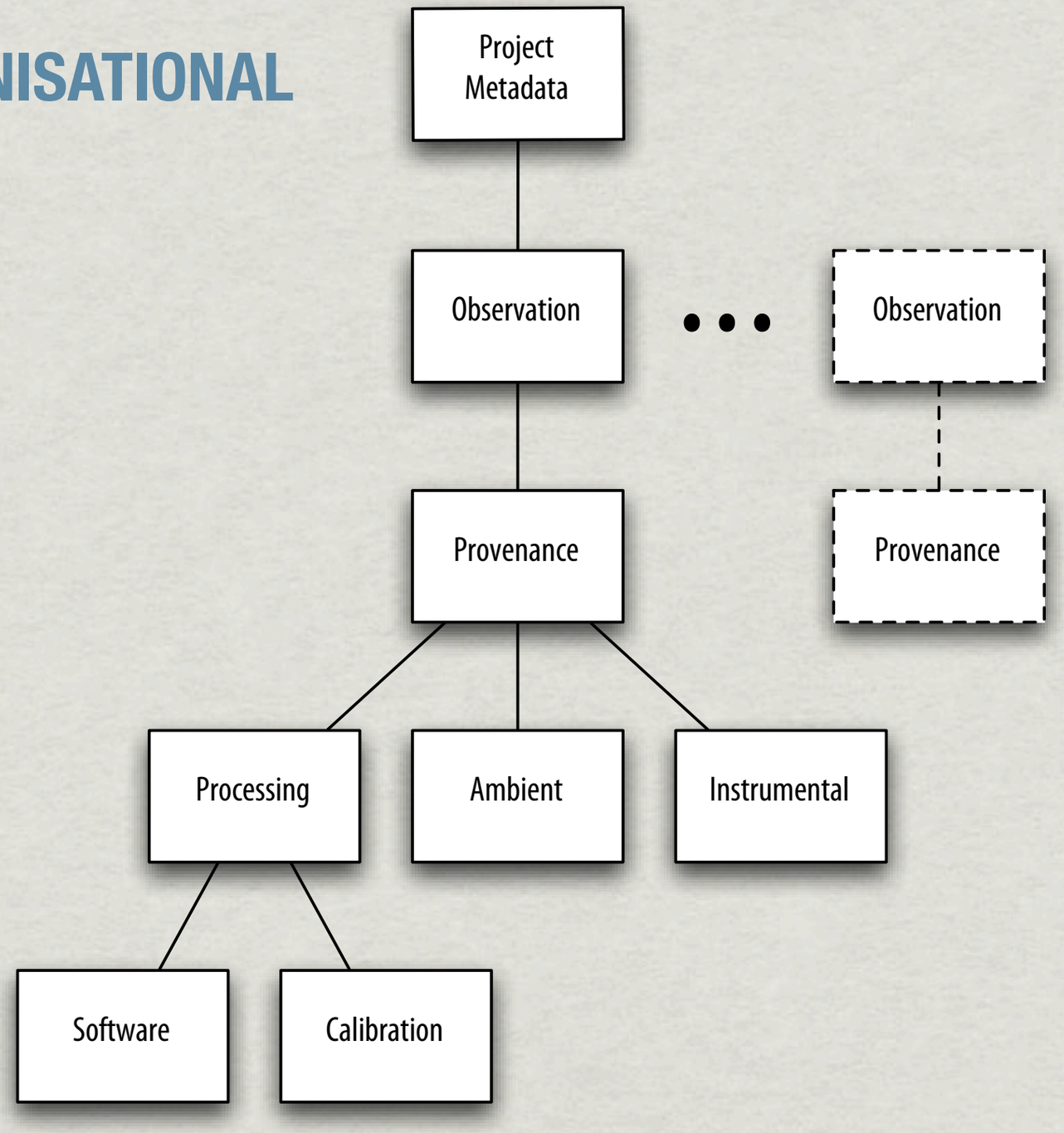

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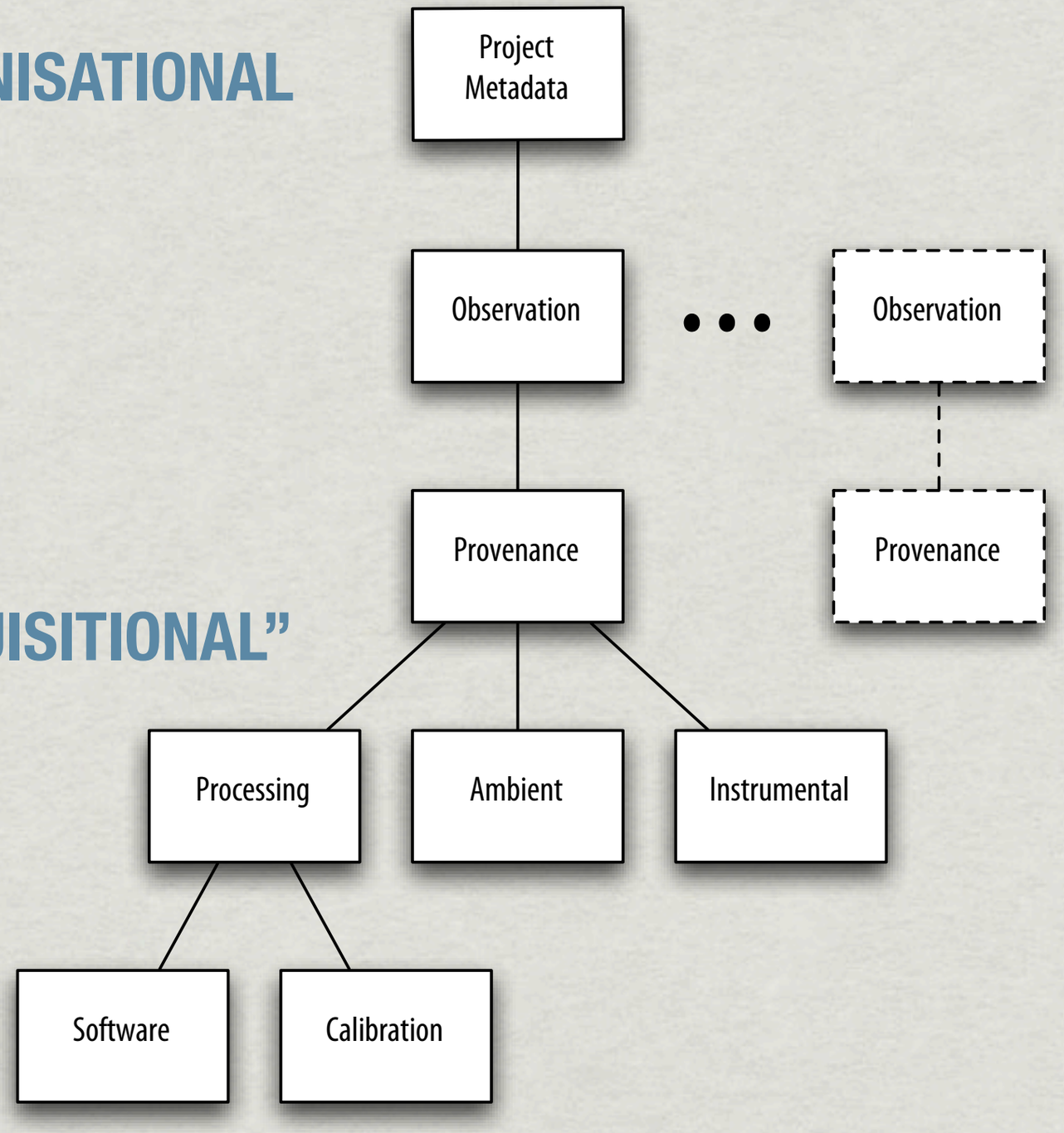

“ACQUISITIONAL”

INTERNAL PROVENANCE WHITEPAPER BY N. DELMOTTE

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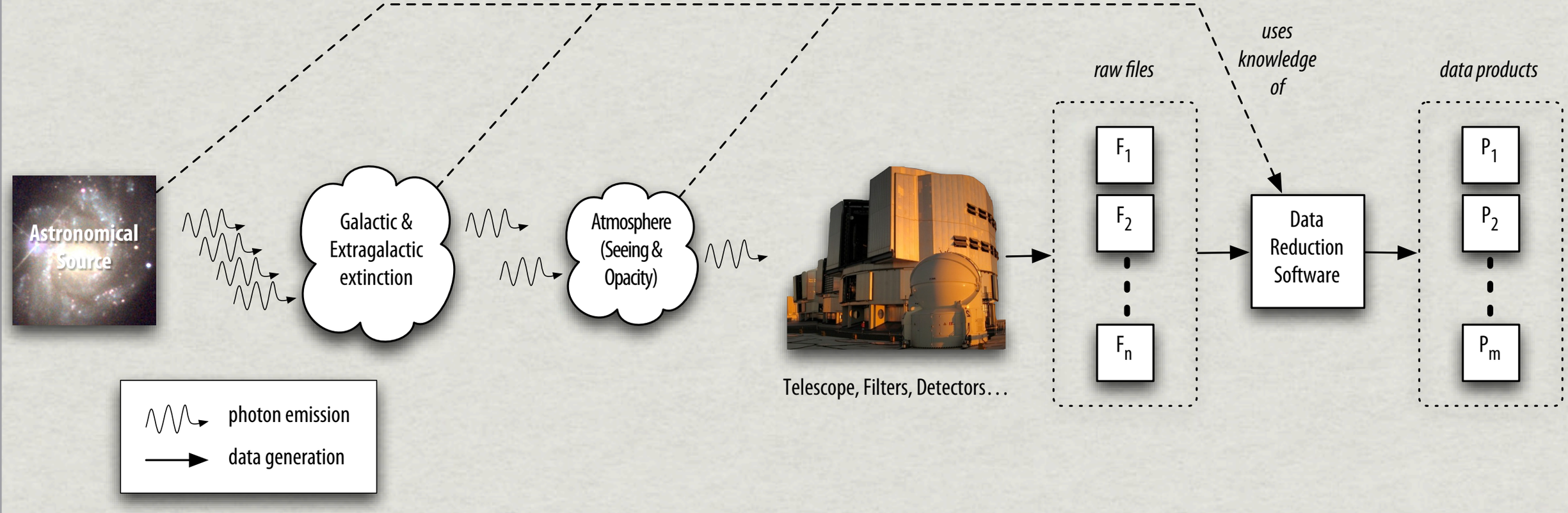

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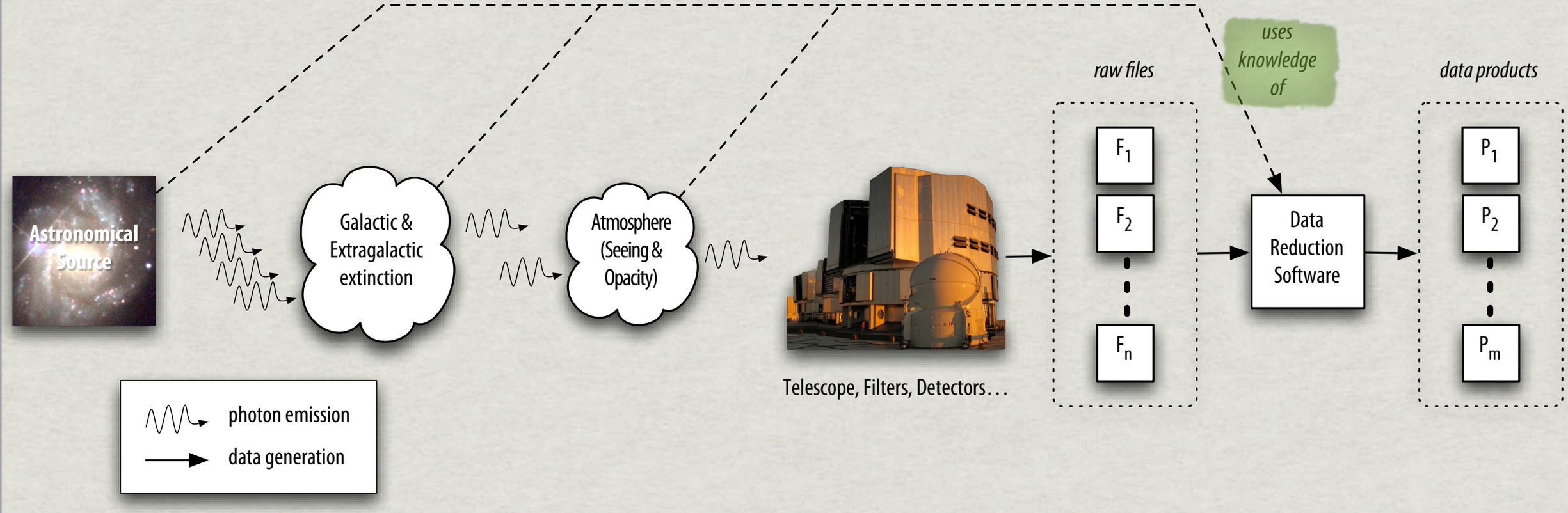

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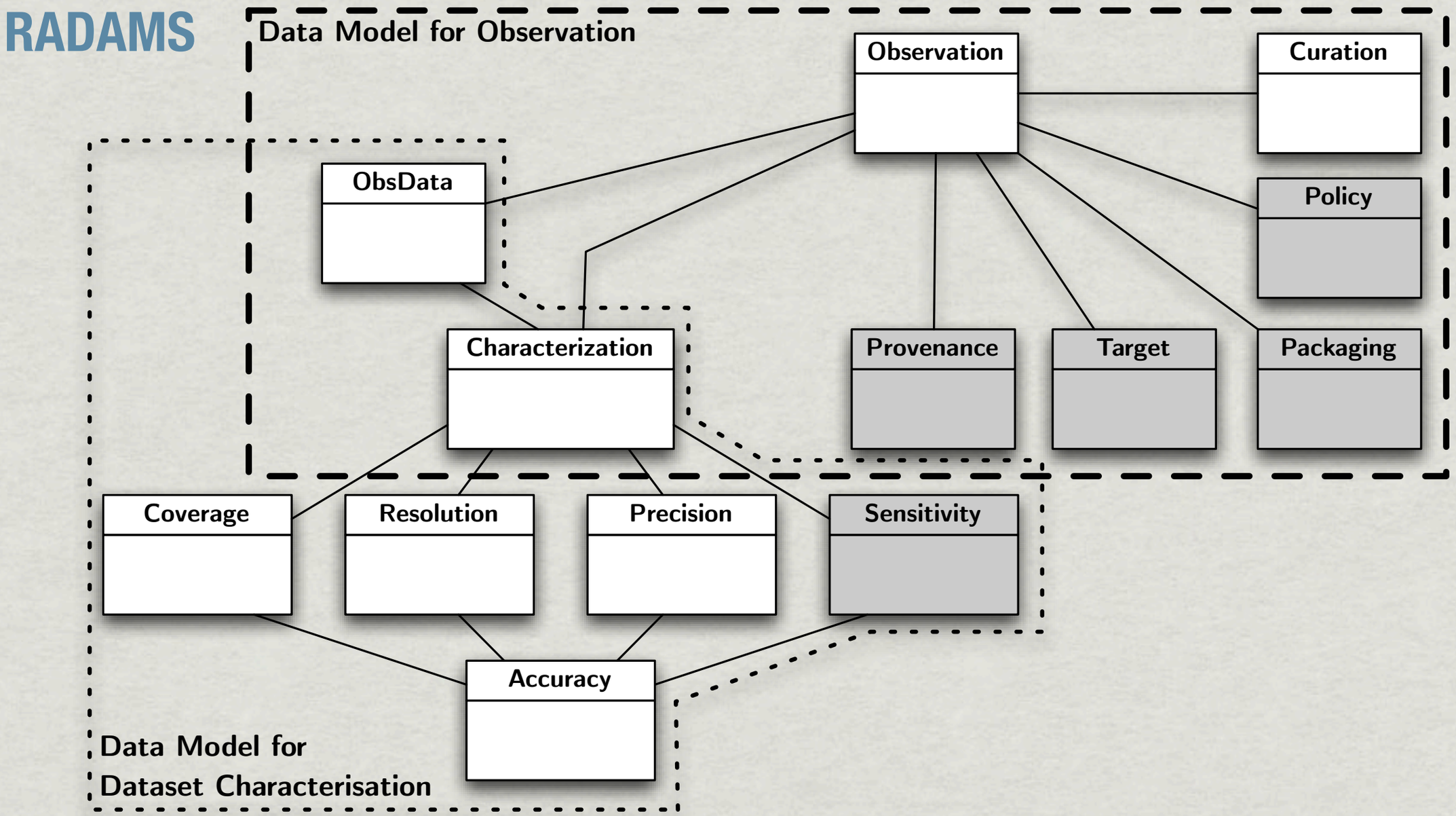

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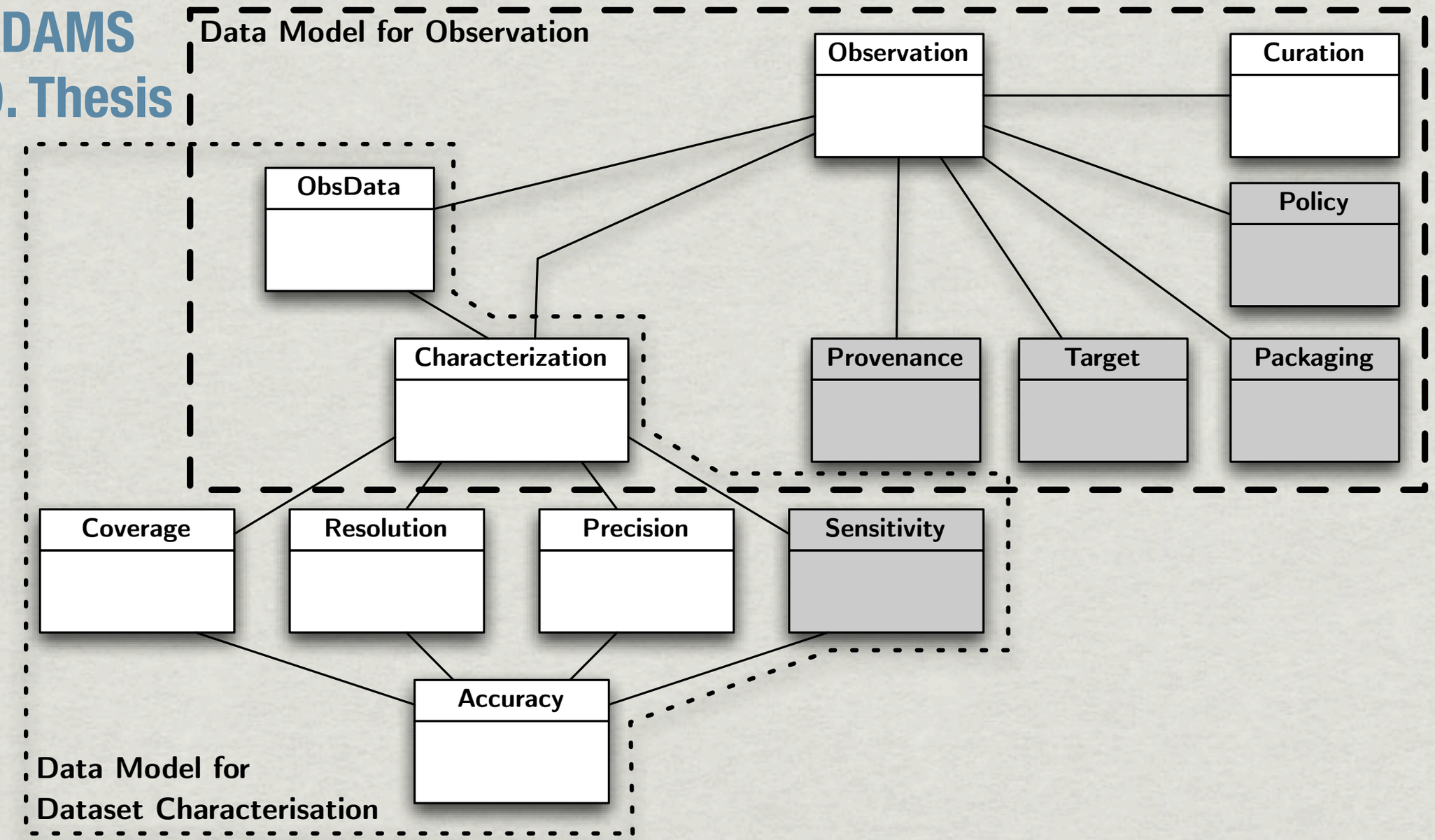
RADAMS
Ph.D. Thesis



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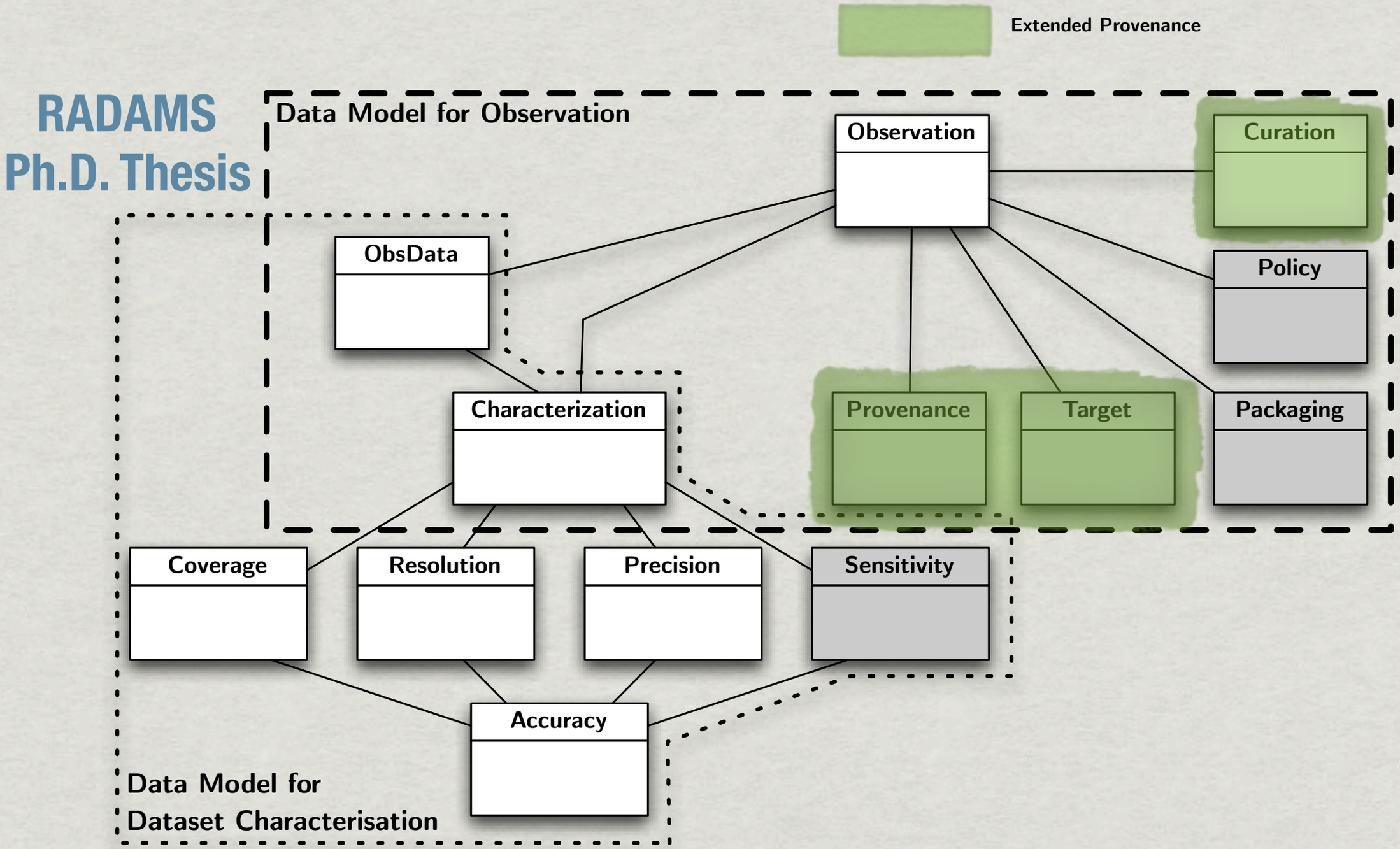

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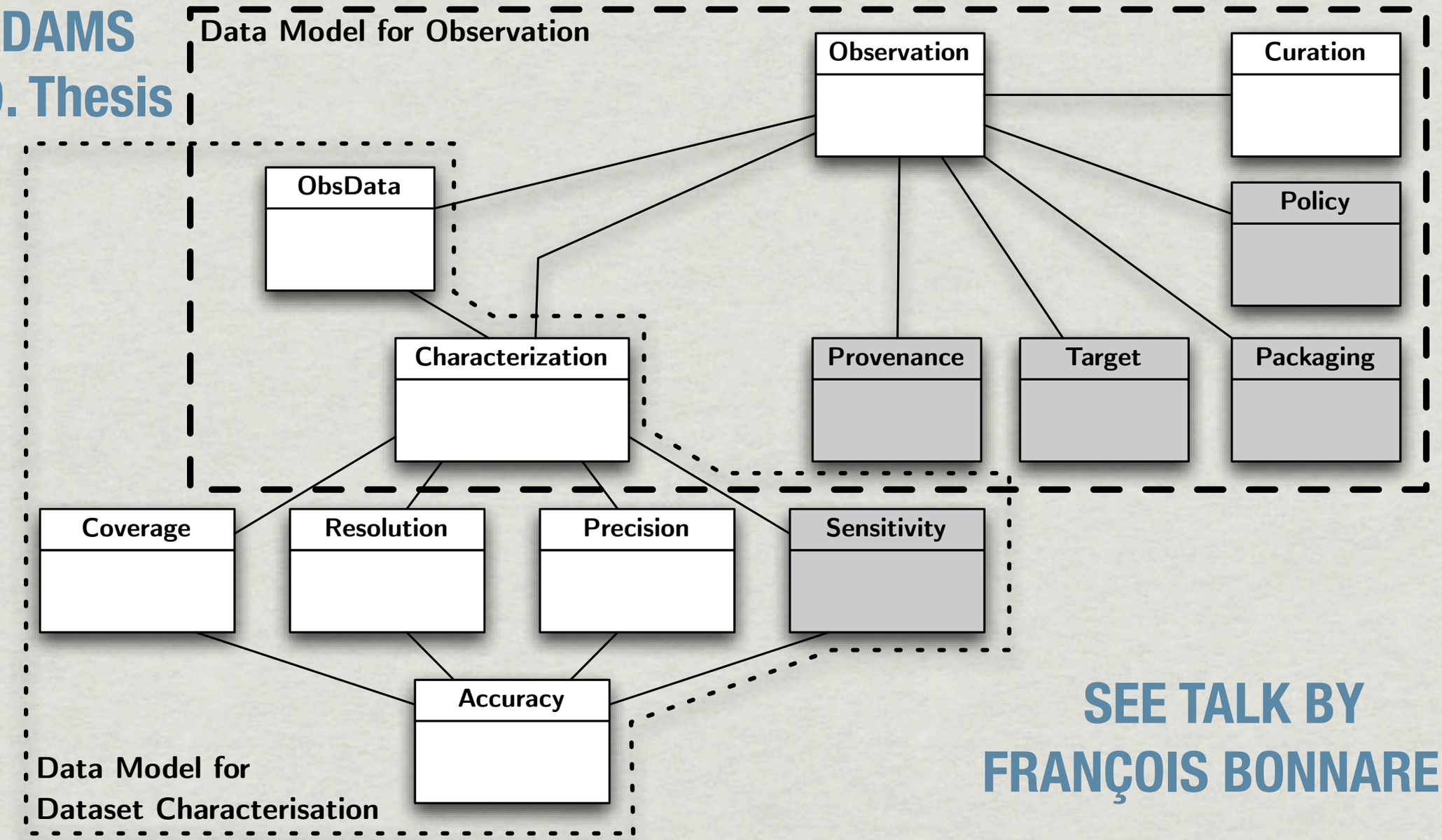

SEE TALK BY FRANÇOIS BONNAREL

The case(s) for Provenance

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- Use cases for Provenance, centred around the core concepts:
  - **History** of a data set (**documentation**)
  - Establishing **ownership**/providing **attribution**
  - **Quality** assessment

History of a data set (ESO)

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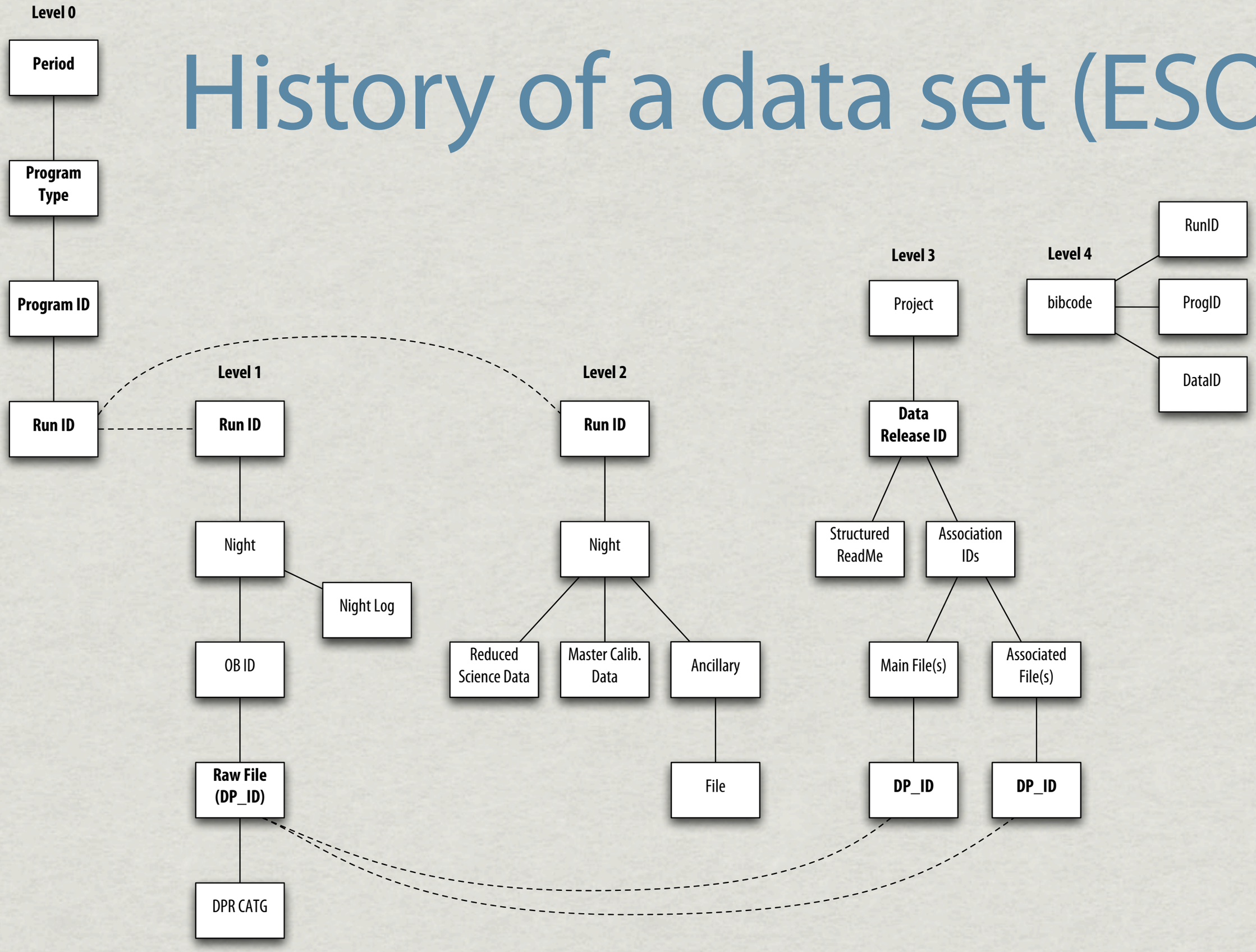

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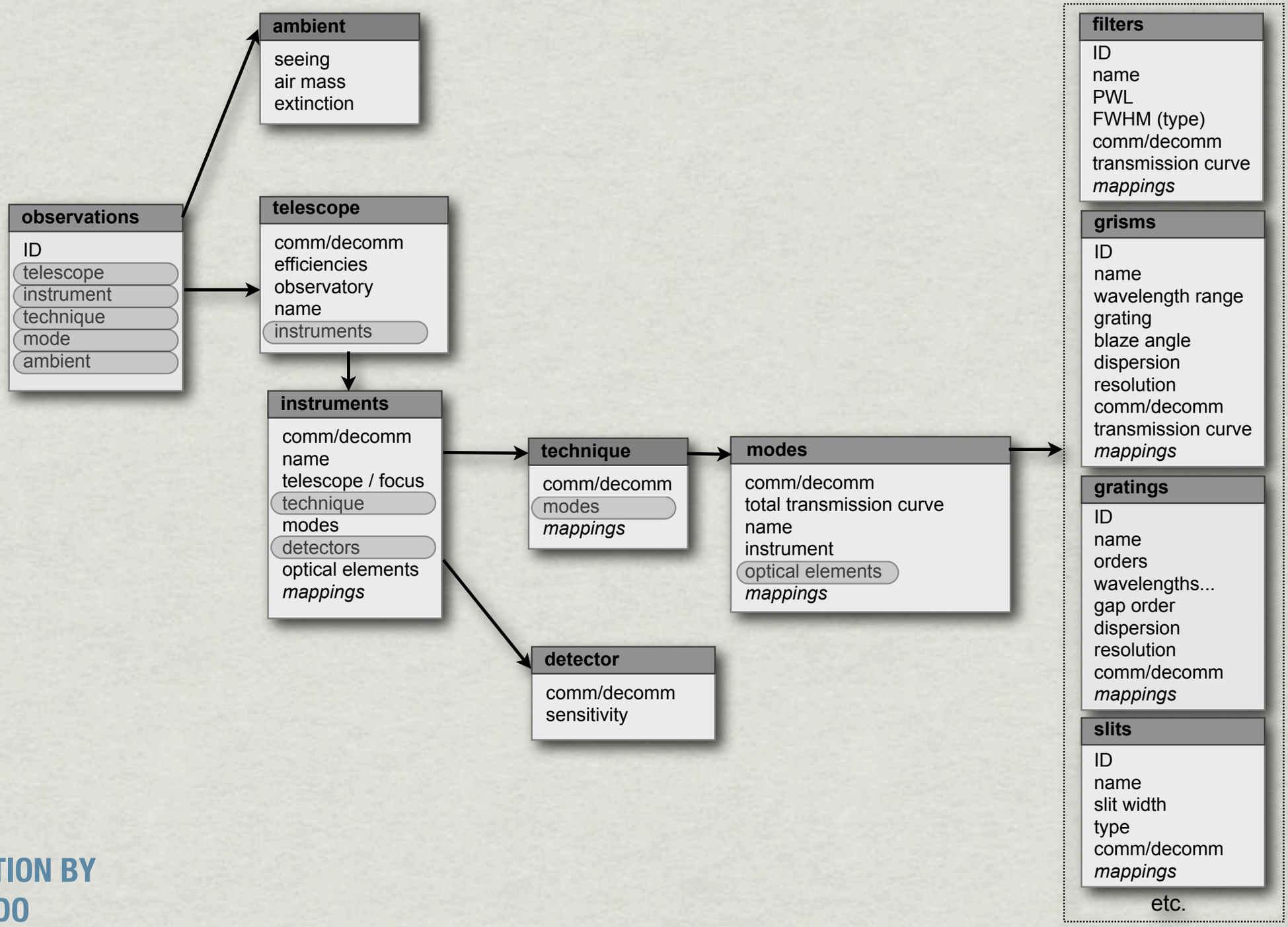

COMPILATION BY
A. DELGADO

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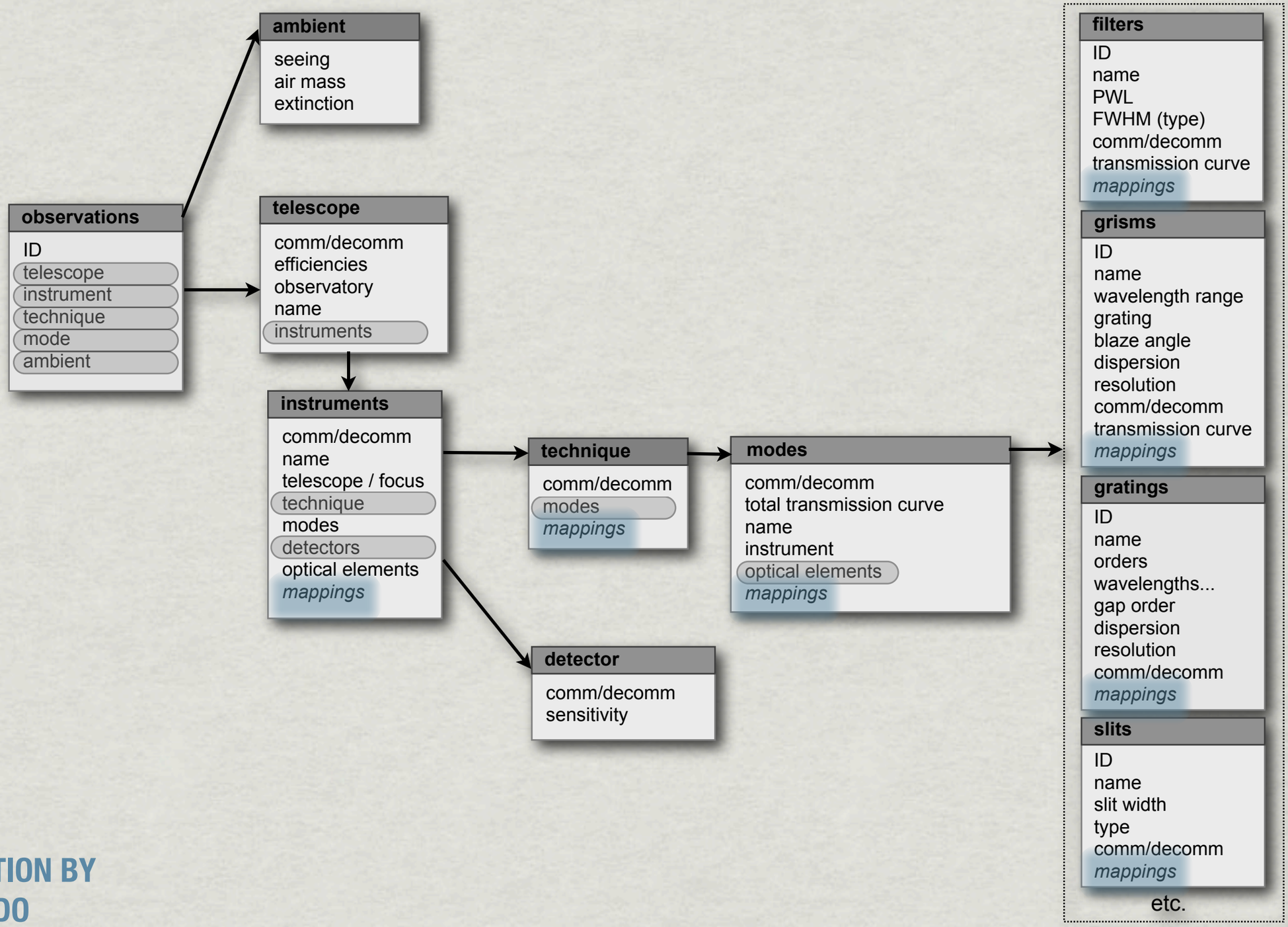

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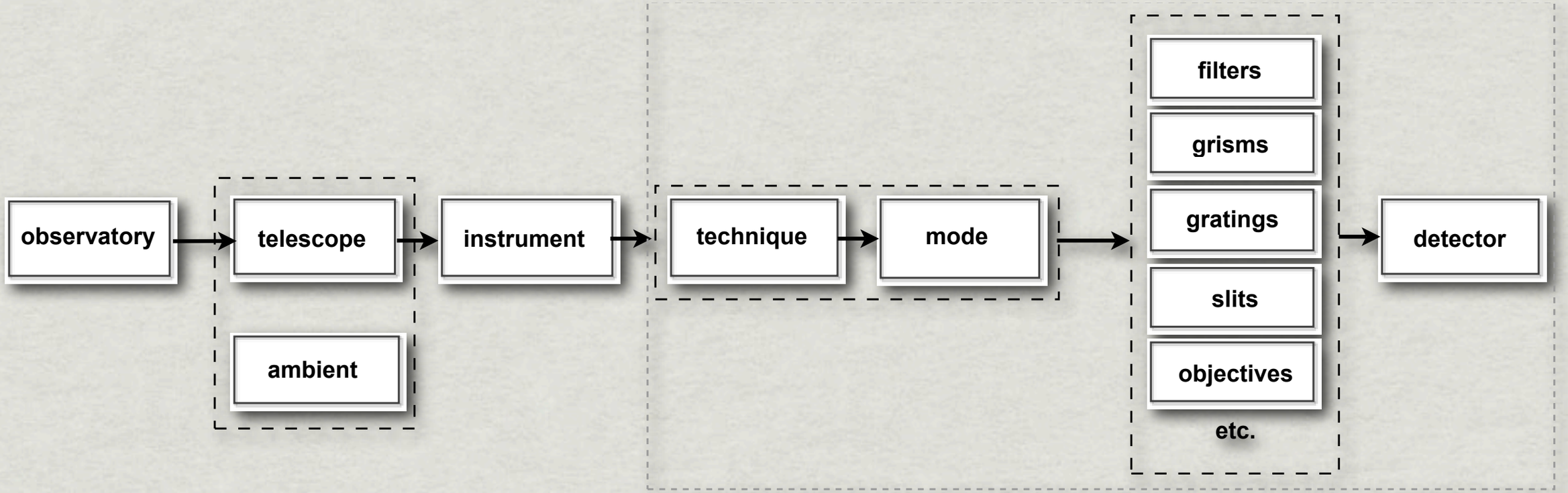

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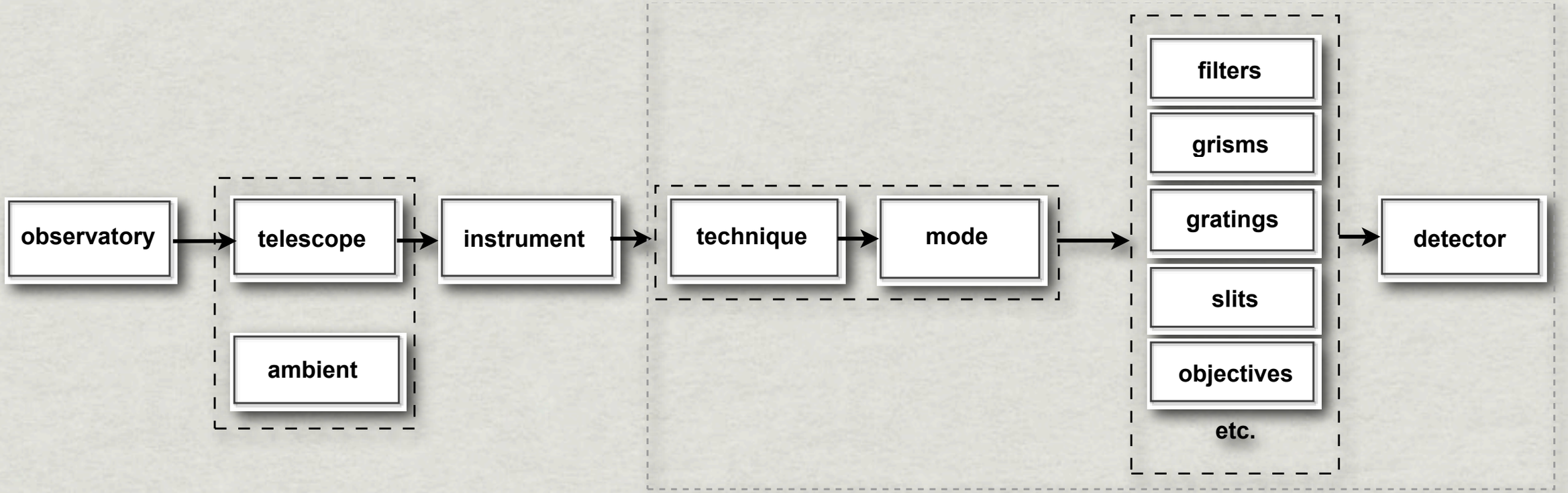

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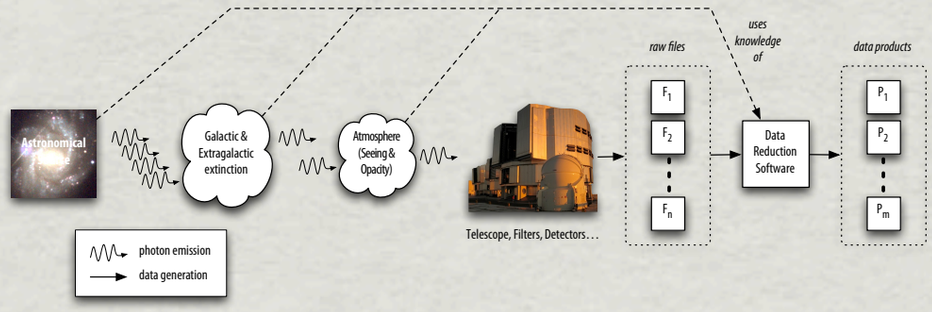

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- **Telescope Information**
  - Site
  - Dates: First Light, Commissioning…
  - Instruments & Optical Elements
- **Instruments**
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  - Configurations
- **Optical Elements**
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  - Kind (Filter, Grisms, Gratings…)
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TIME CHANGING

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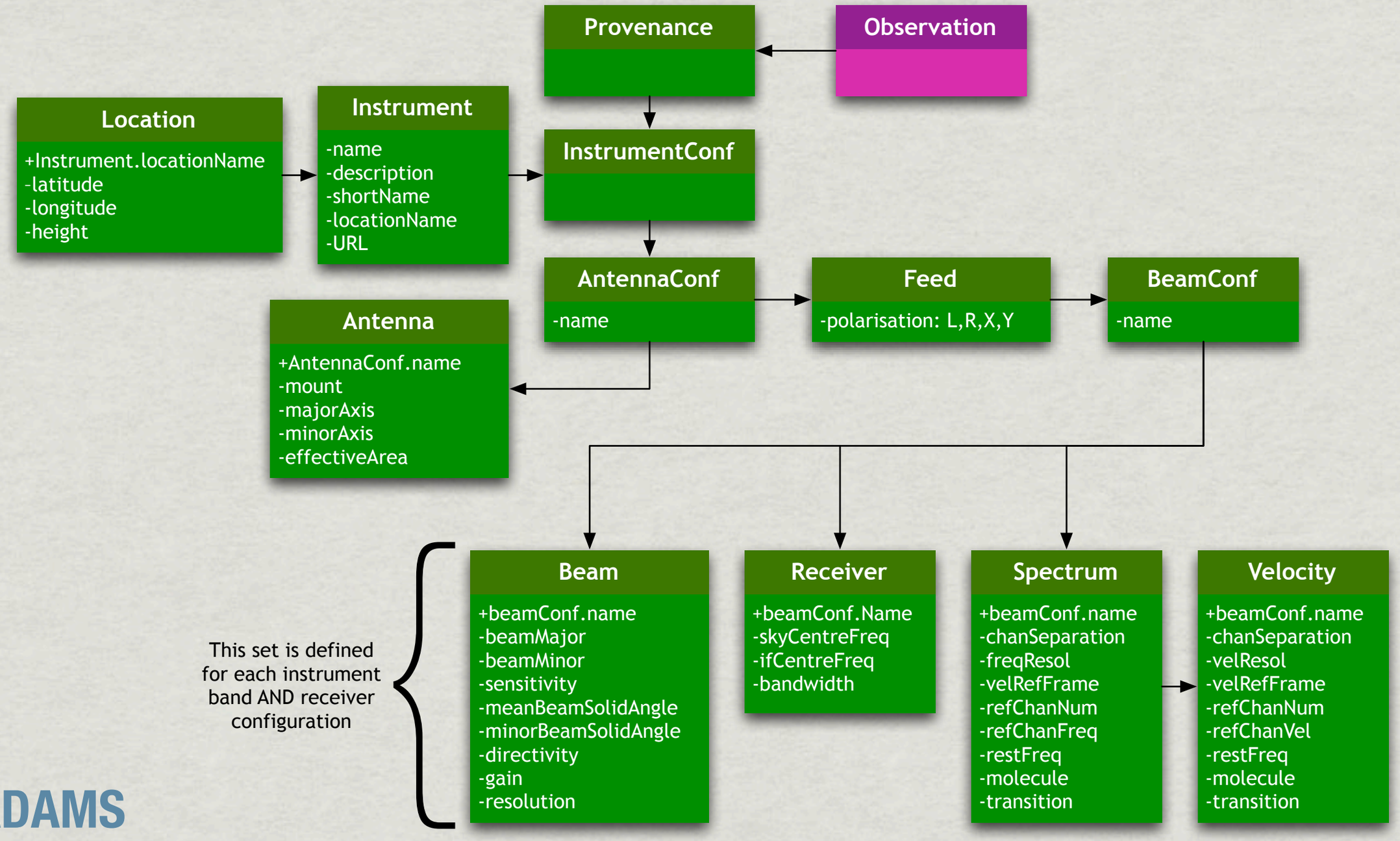

RADAMS

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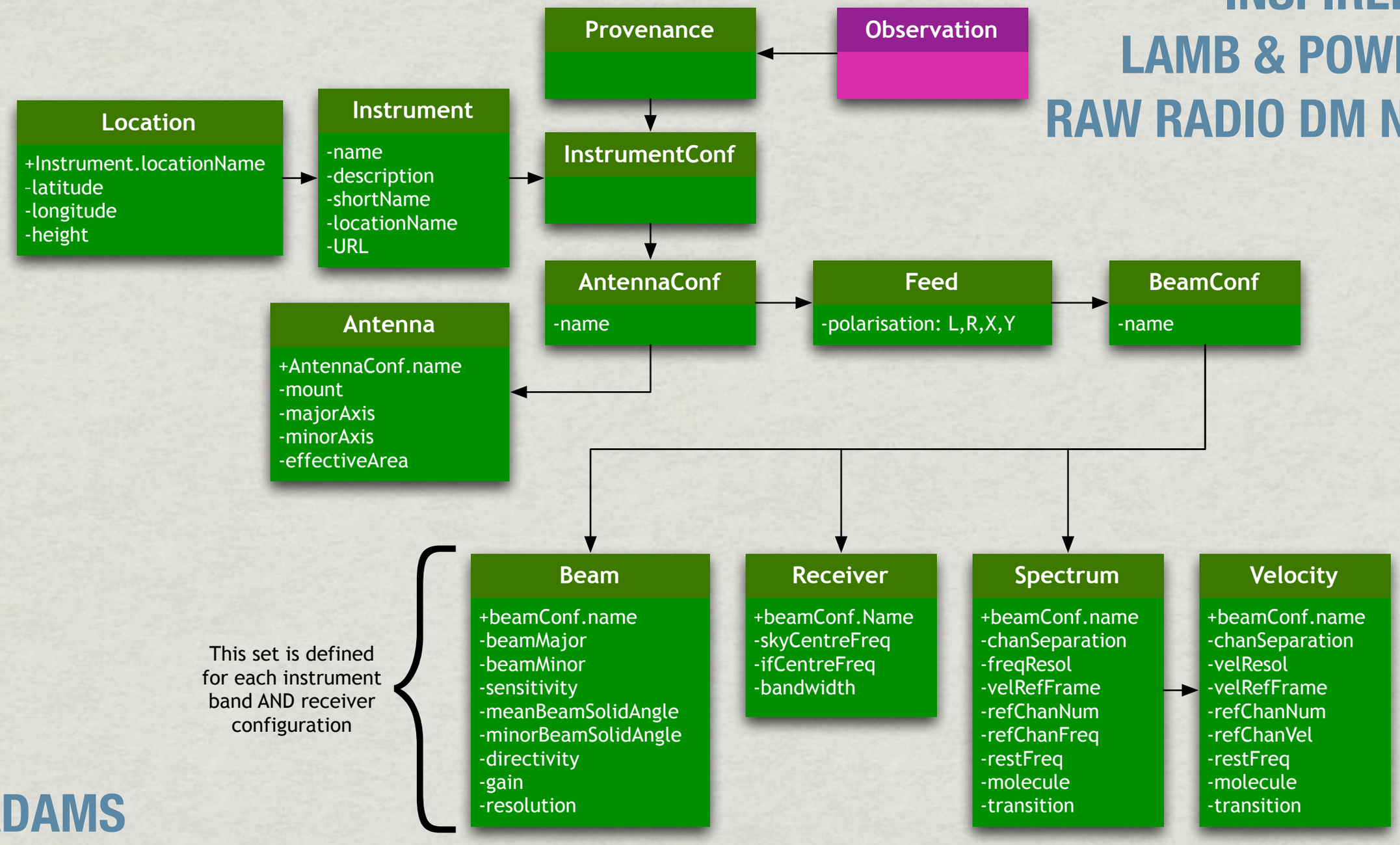
INSPIRED BY LAMB & POWER'S RAW RADIO DM NOTE



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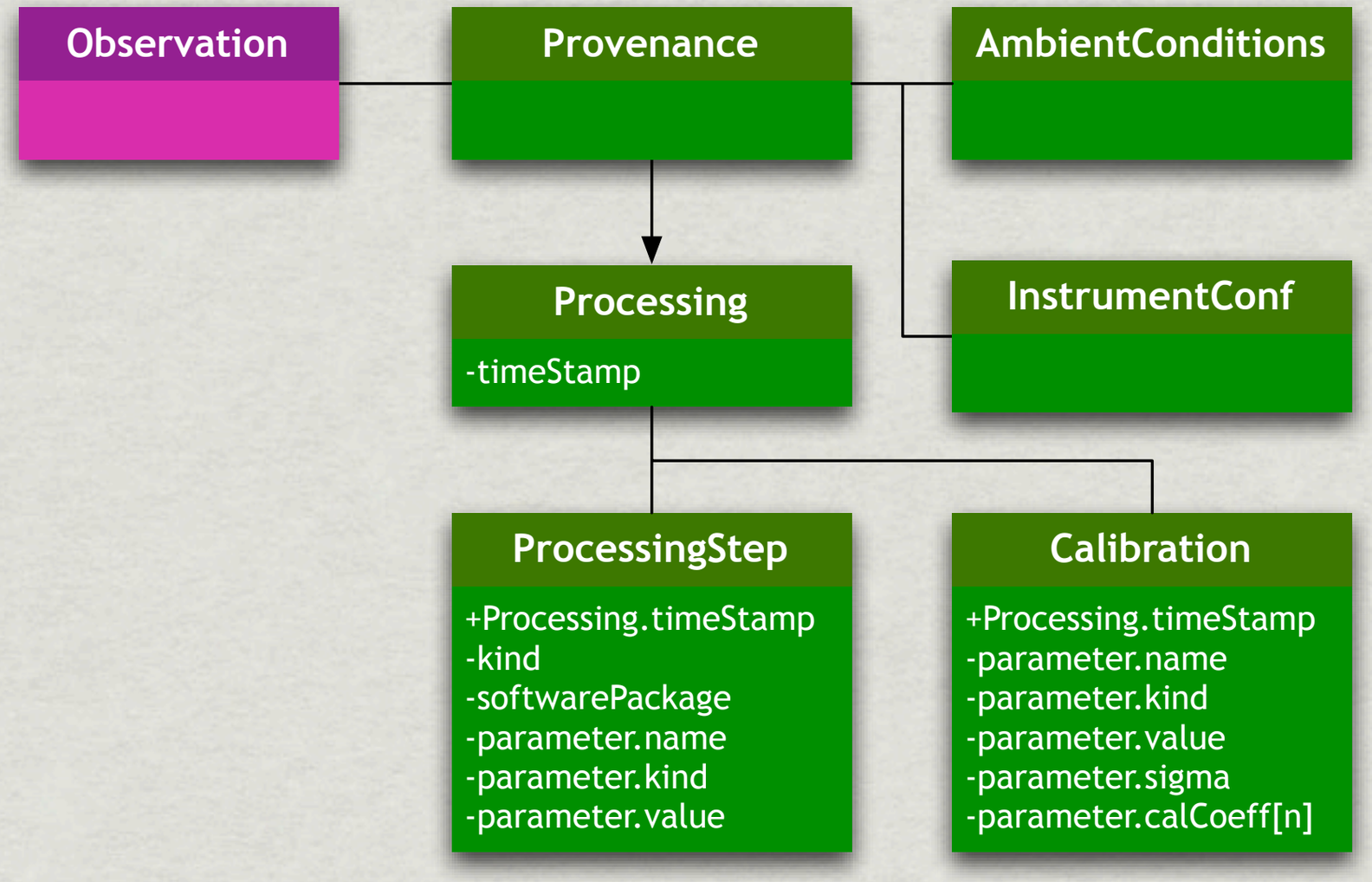

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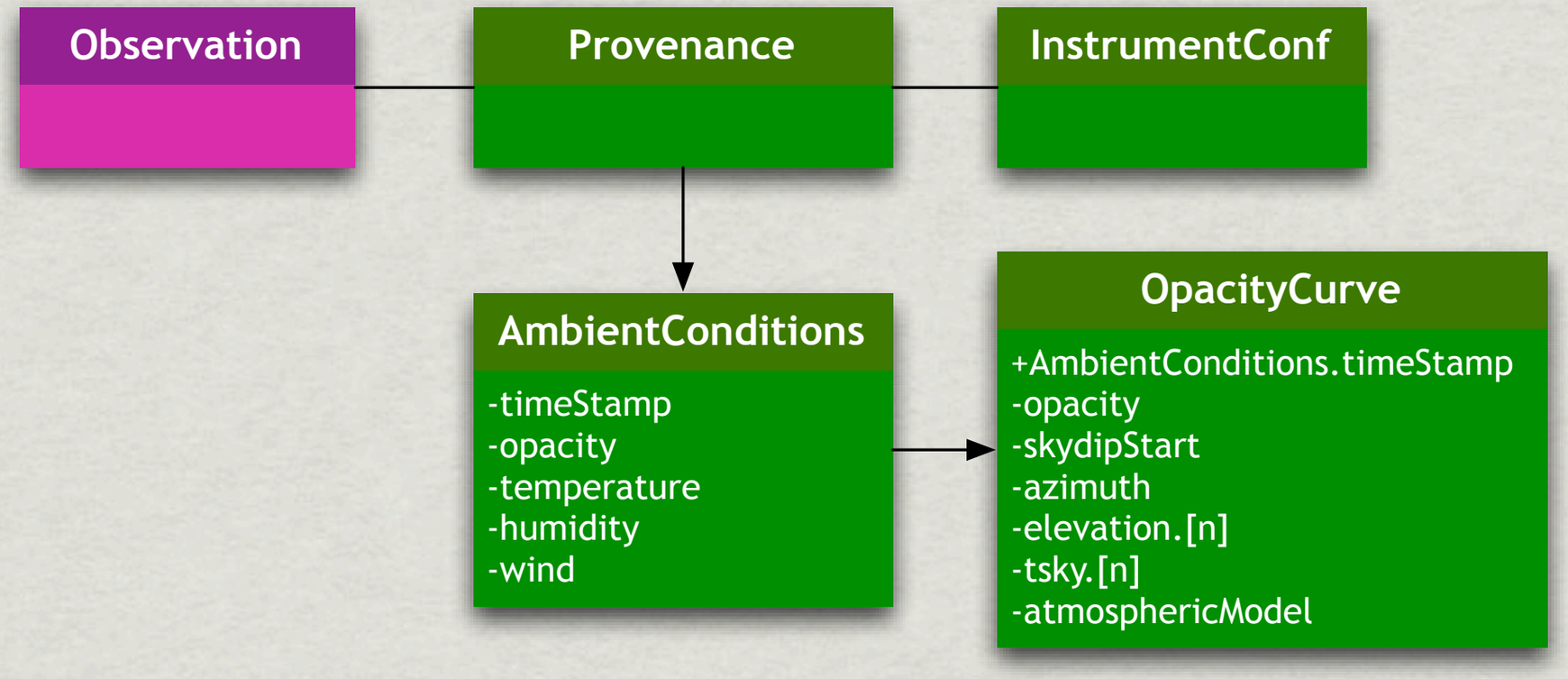

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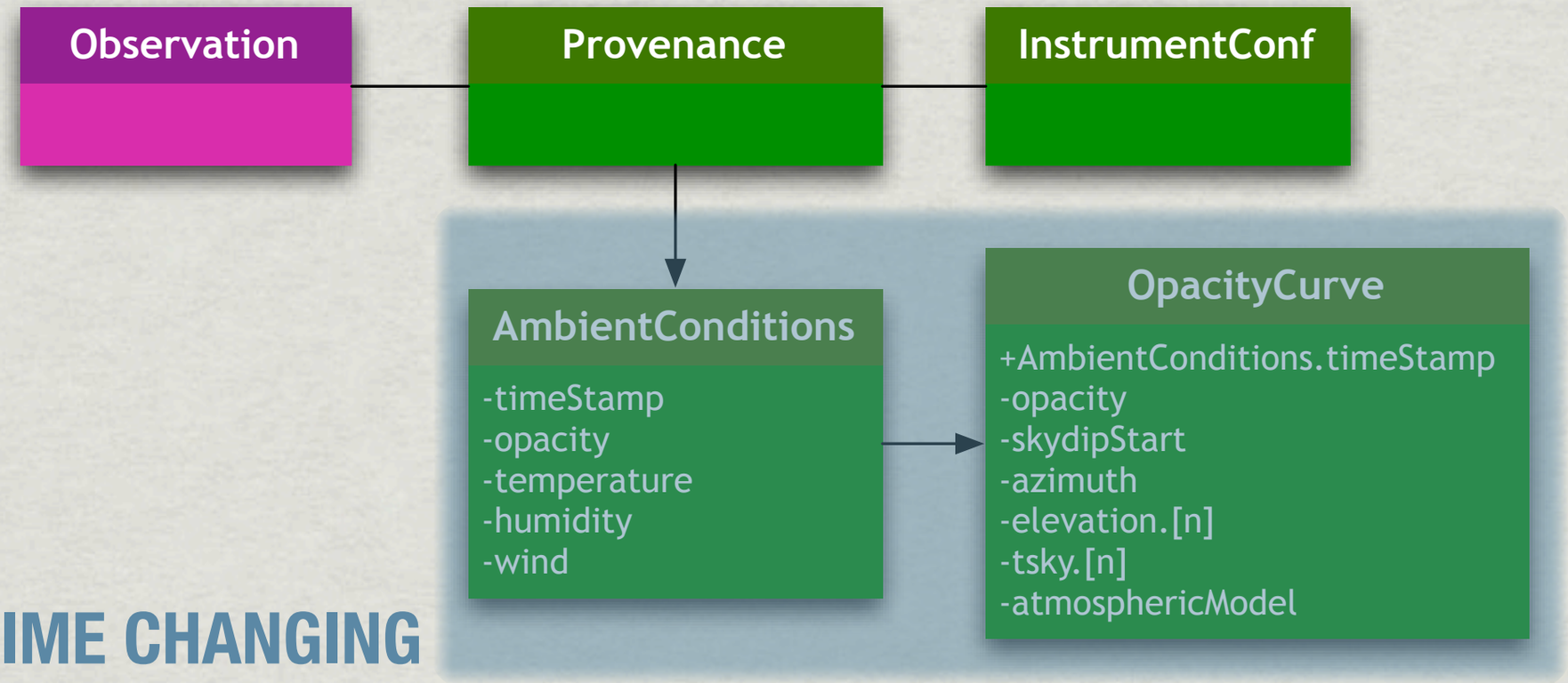

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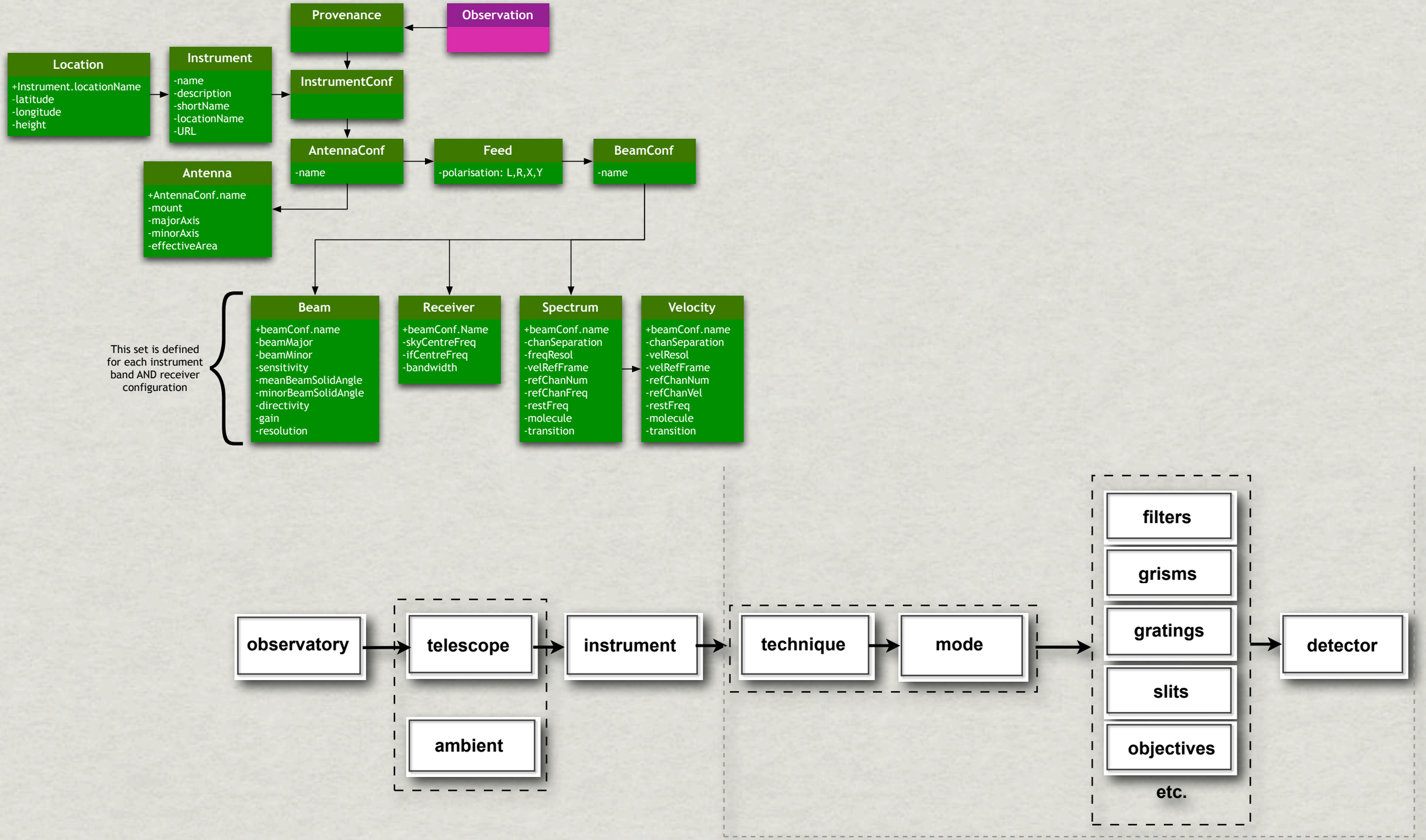

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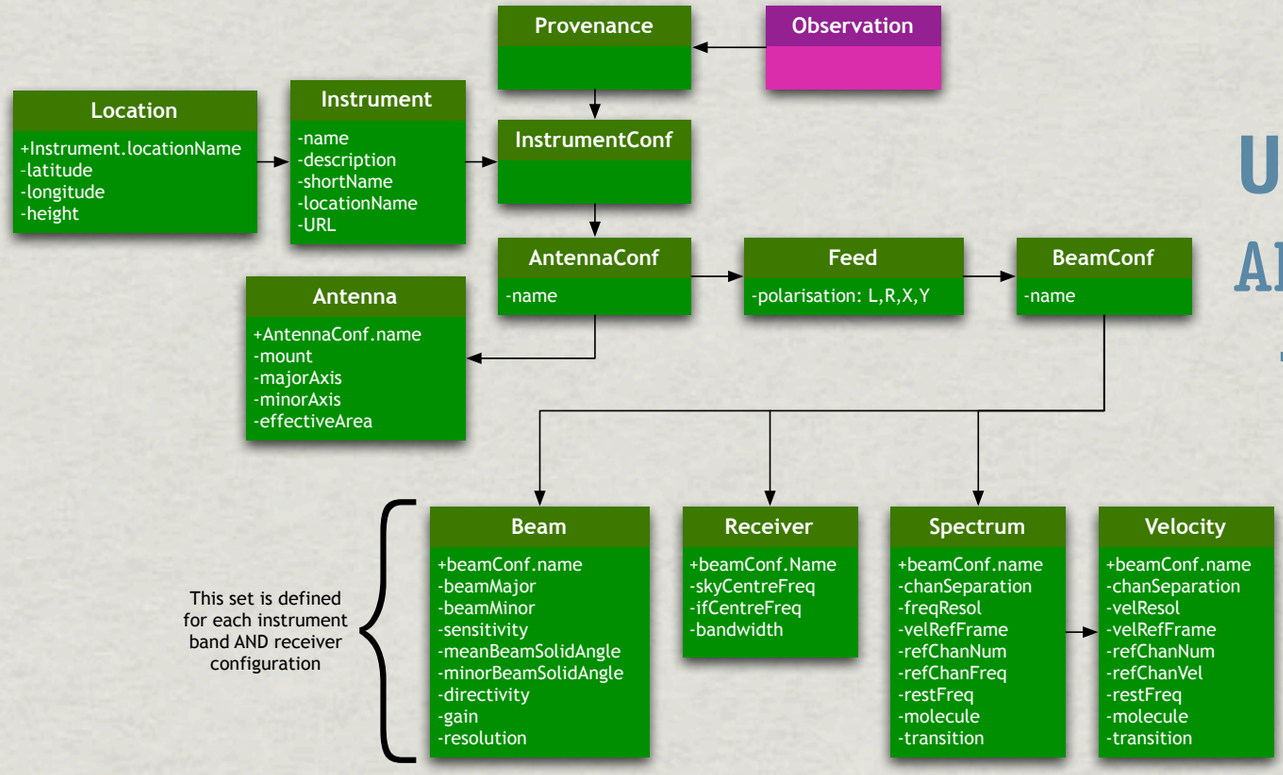
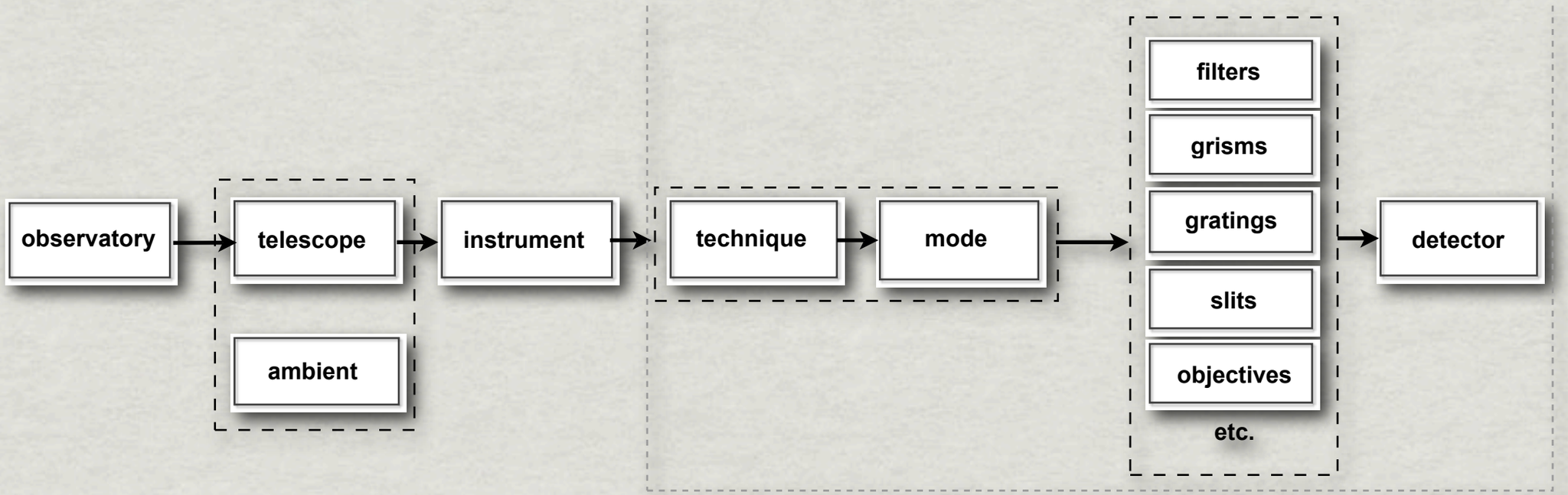


UNIFICATION OF PROVENANCE AT THE `AMBIENT`, `TELESCOPE_CONF` LEVELS:

THE REST IS VERY HETEROGENOUS



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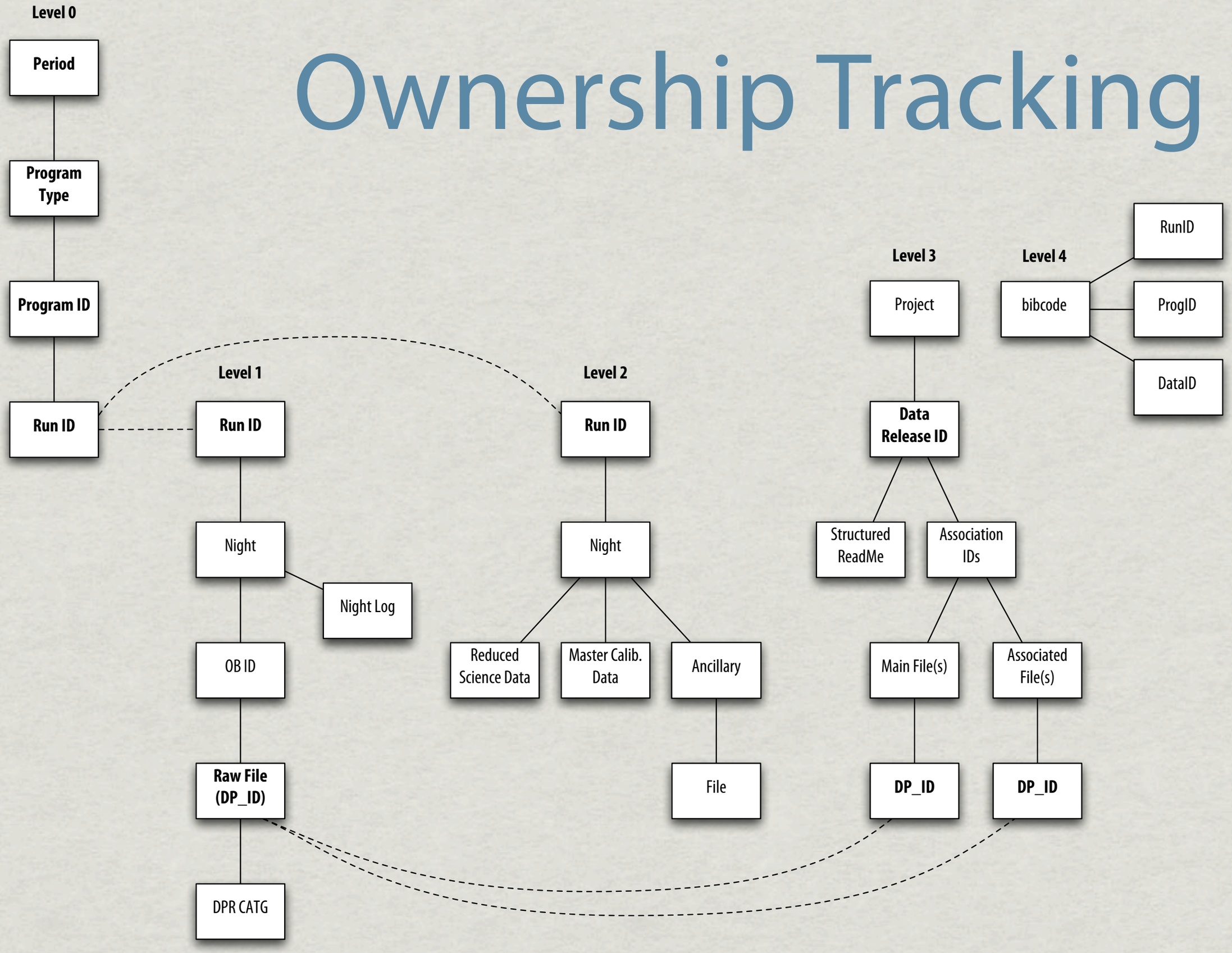
+ SYSTEMATIC OBSERVING LOGS!

Ownership Tracking



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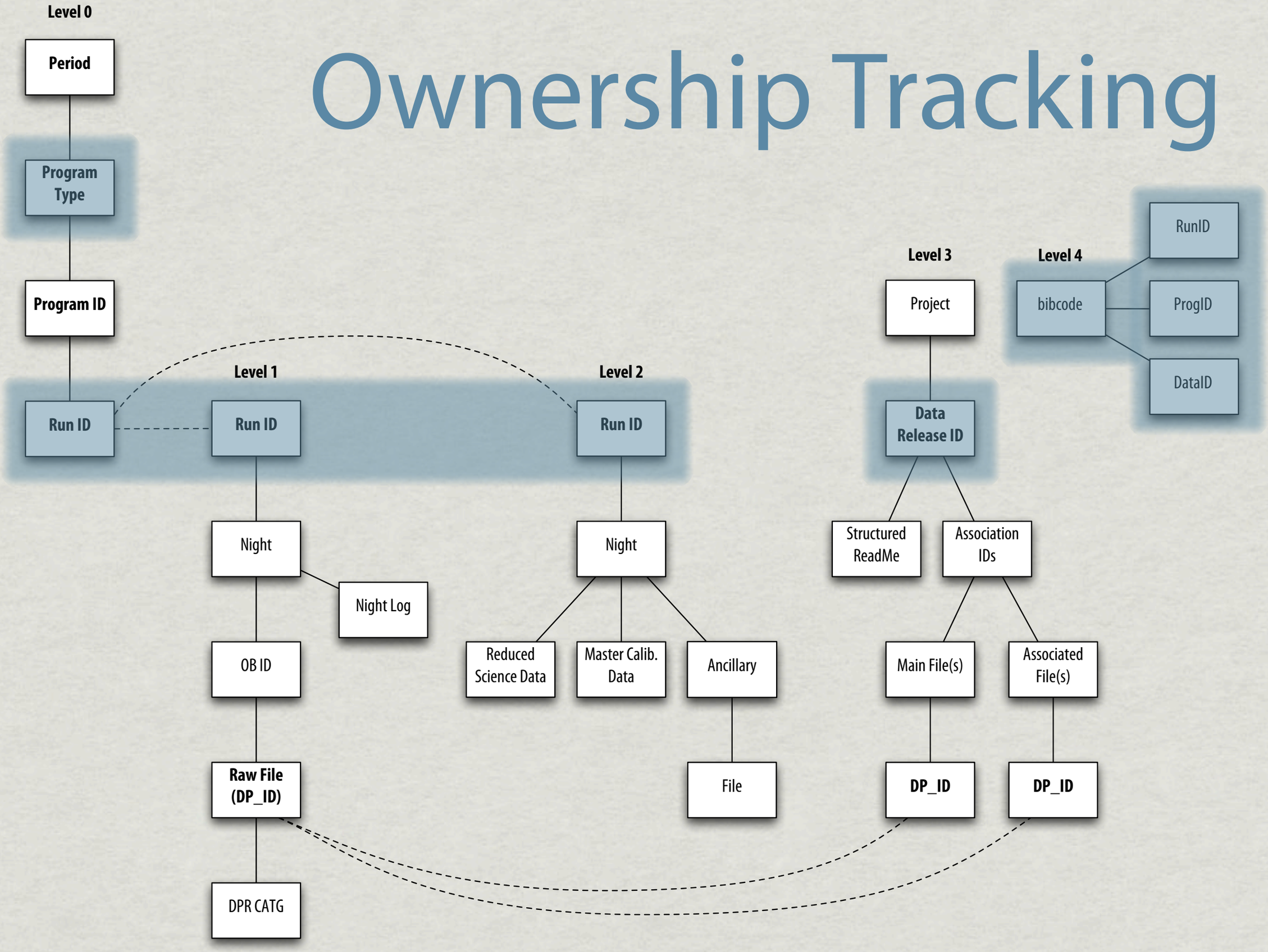

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THIS TRACKING CAN BE USED TO MEASURE PUBLICATION RATIOS

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NO OBJECTIVE, ONE-SIZE-FITS-ALL, QUALITY ASSESSMENT METRIC

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TIME CHANGING

Queriable Provenance?

- Most queries, on **Characterisation/Target/Curation**
- **Instrument-specific forms** for instrument configurations
  - Allow UType/UCD/IVOAT **key-value pairs**?
  - Instrument-specific *a priori* quality assessment
  - *A posteriori*, usage-specific quality assessment, offline > usage-specific query to data Provenance

Conclusions

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- Provenance is an **integral part** of the Observation DM
- Provenance comes with **discipline**, but allows for **quality science**
- Different approach for different kinds of instruments, but all **under the same general framework**
- Provenance should be accessible for any item; **specialised TAP** version?

Conclusions

- Data centres: **consistent naming/coding**, plus mappings for existing data
- **History, history, history**!
- Should we **forget** about **past data**, and focus in the **future**?

Vielen Dank!

STARTING WITH MY GERMAN CLASSES ;-)