



SourceXtractor++

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on behalf of SDC-CH

SExtractor2

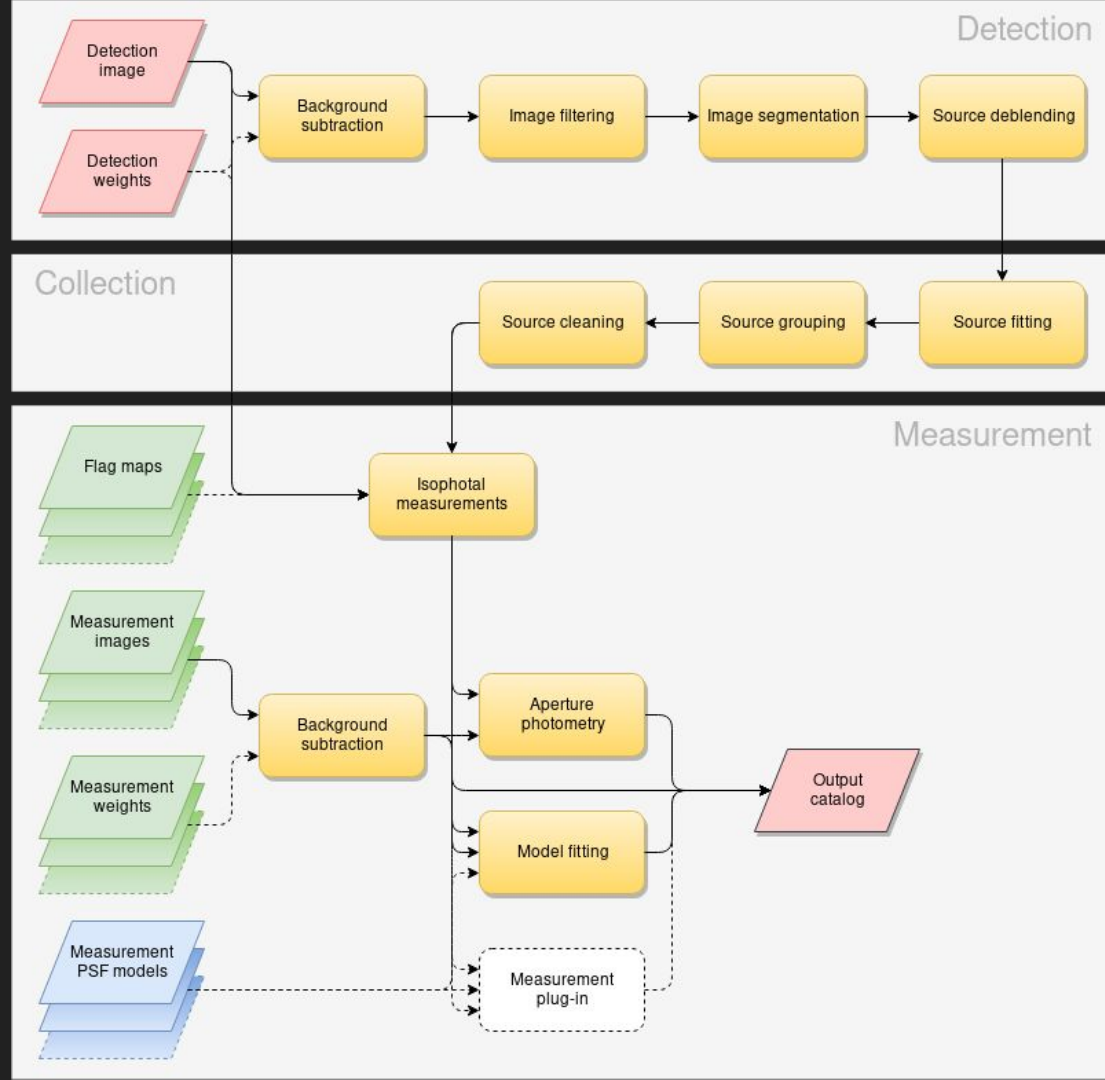
- SExtractor2 (1995) is a very succesful project (over 9,000 citations!)
- It introduced model fitting in 2010
- The limitations of the design started to become problematic
 - Multi frame measurement
 - Overlapping objects
 - Difficult to collaborate due to the intricacies of the code

SourceXtractor++

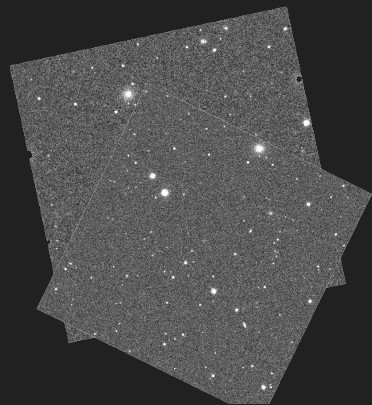
- Emerges as a collaboration inside the Euclid context with the original author of SExtractor 2, Emmanuel Bertin
- Complete redesign of the code
 - Object oriented (C++ with bits of Python)
 - Modular design, with clear separation of responsibilities
 - Possibility for third party plugins
- Aim to provide most of what SExtractor2 did, and more
 - Feedback very welcome on what's missing!

SourceXtractor++ new functionalities

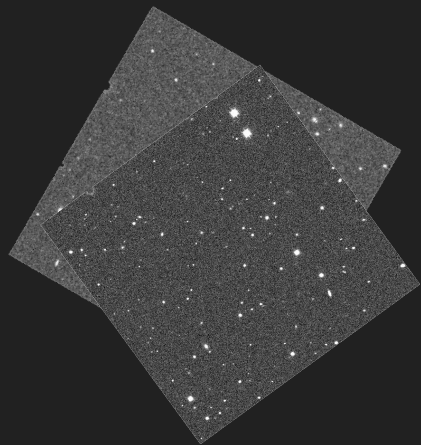
- Multi-frame measurements
- Multi-frame model fitting, with support for overlapping sources over multiple images/bands/...
- Image handling based on tiles



G

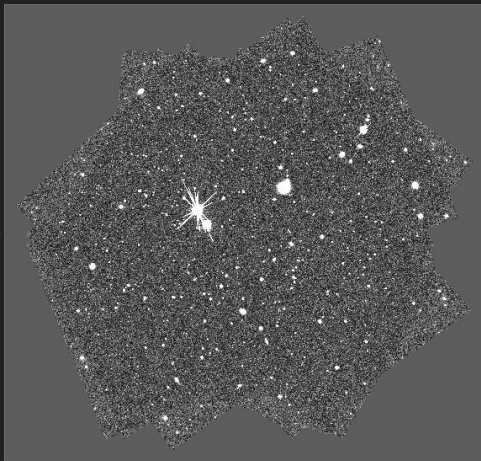
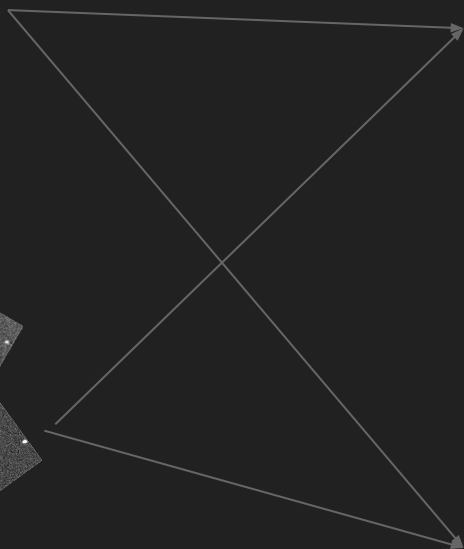


R

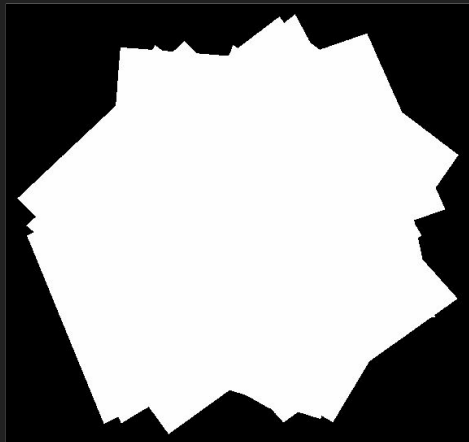
**Measurement frames**

Each one can have its own weight map, variable PSF model, etc.

They can be grouped by almost any arbitrary consideration

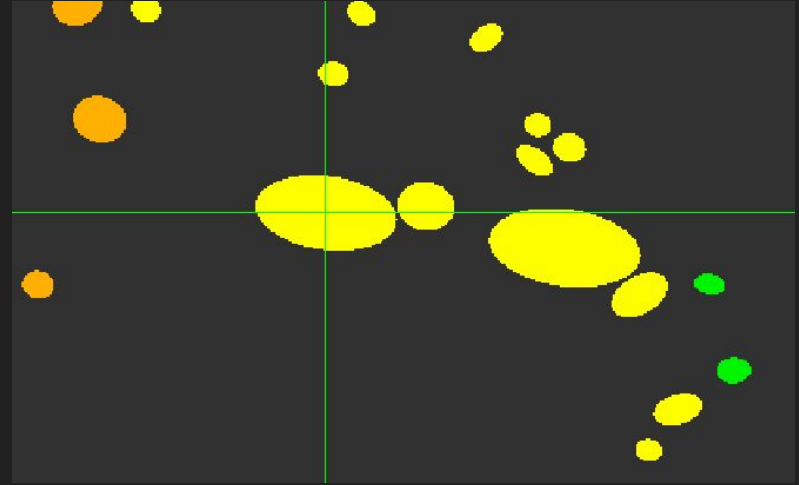
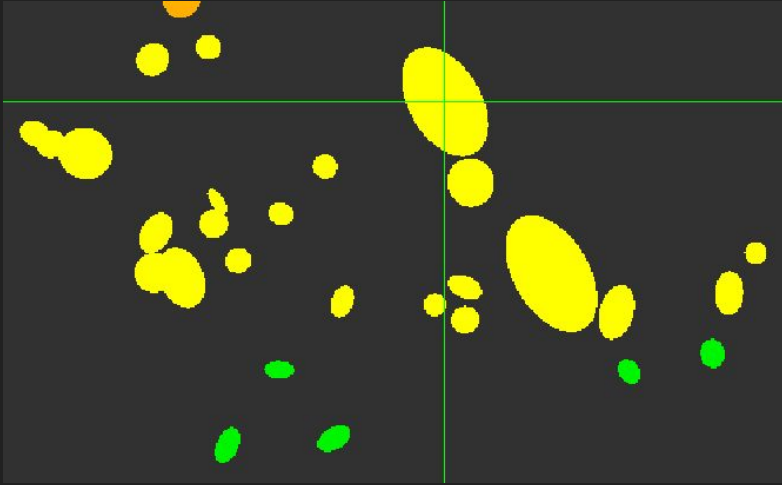
**Detection image**

Detections are done on a co-added image first, and then projected into each individual frames using the WCS information

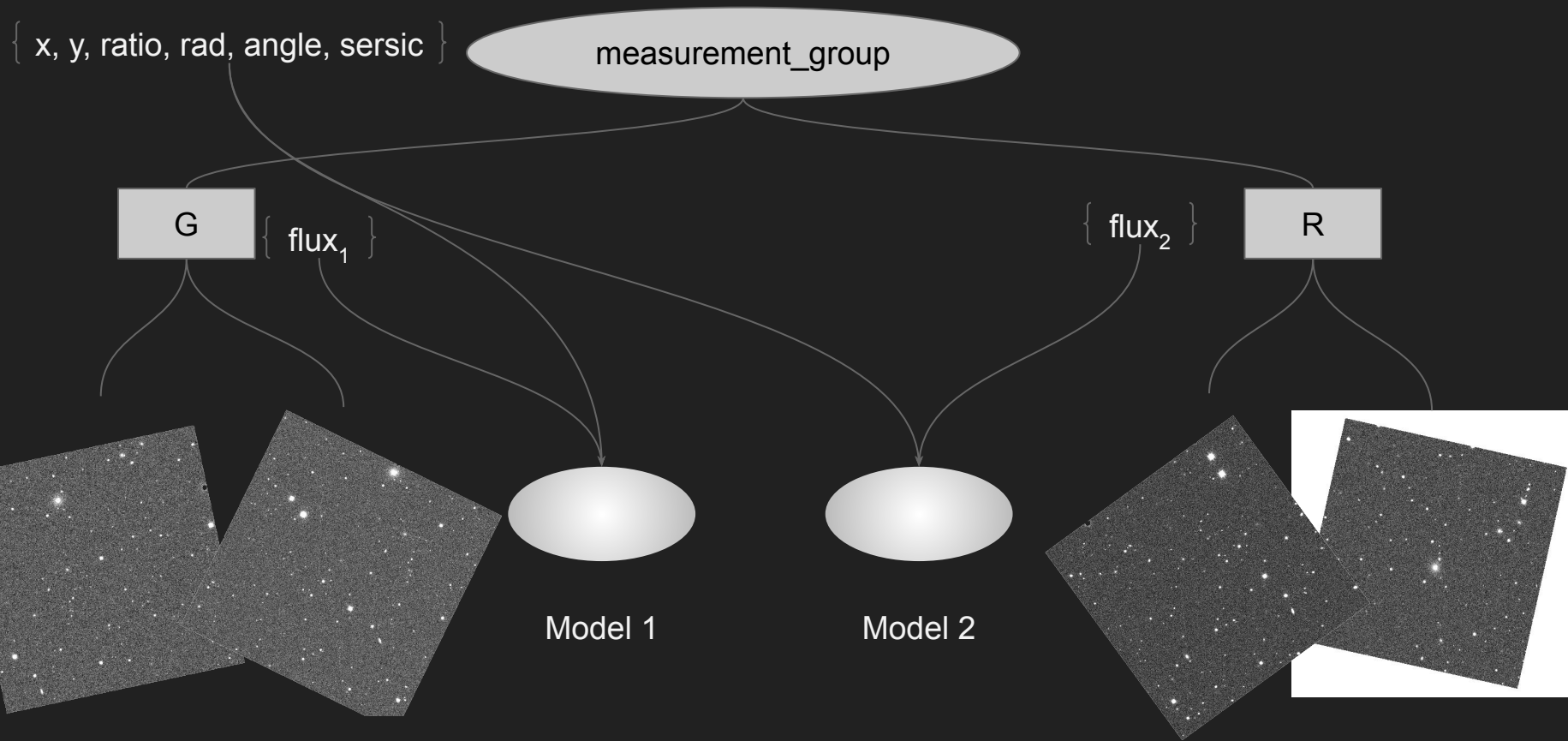
**Weight image**

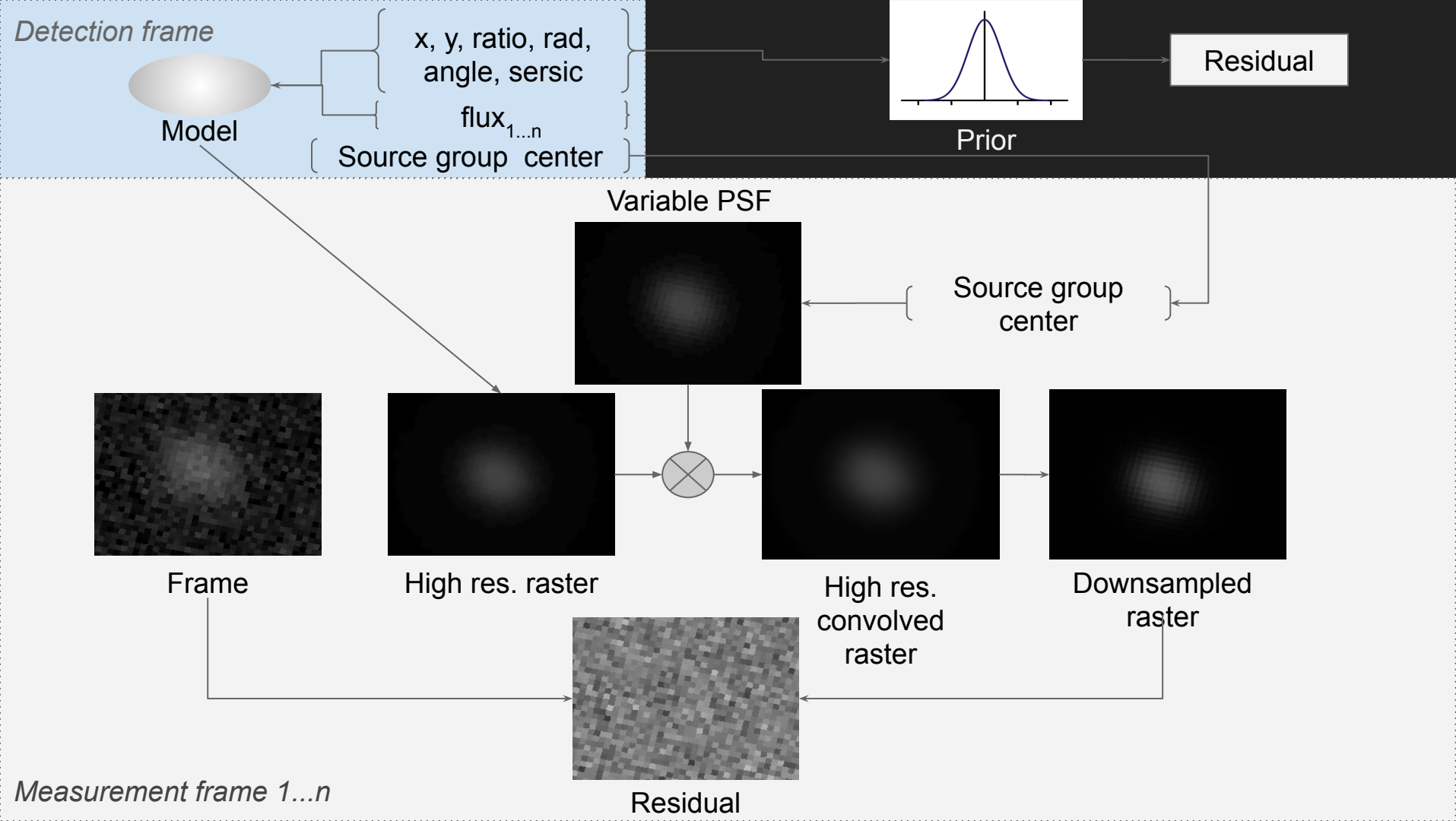
Optional, but helps reducing spurious detections on the edges of the coadded image

Measurement apertures are configured on the reference frame of the detection image, and projected into the measurement frames



Multiframe model fitting





Example of fitting of proper motions

- Point-source model on **36** simulated exposures
- **Variable point spread functions**
- Error bars automatically computed by SourceXtractor++
- The simulated star field has
 - 10% of stars that move at 10 mas/yr
 - Remaining 90% are at rest

