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ASKAP Software & Source Finding

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Pipeline Software for ASKAP

- ASKAP Computing group responsible for creation of pipeline-processing software
 - Everything from ingest of visibilities to storage in the archive
 - Imaging, cataloguing, quality assurance
- Large data volumes require large-scale distributed approach, particularly for imaging
 - Conventional reduction tools not suitable
 - Have developed tailored solutions
- Source detection & cataloguing forms part of the pipeline
 - Distributed approach
 - Look to integrate with imaging code, obviating need for disk I/O
- See https://pm.atnf.csiro.au/askap/wiki/sup/Wiki_sup_wg1_m2 for more details on ASKAP pipeline software

Current ASKAPsoft source detection

- Source detection currently built upon Duchamp
- Uses code as a library, and adds functionality on top
- Not just for spectral-line data but for 2D continuum as well.
- Parallel-processing done in coarse-grained fashion:
 - Split up image in user-defined manner
 - Each chunk searched separately with Duchamp algorithms
 - Any sources at/near edge are handled by a master process
 - Reduces memory impact on any single cpu
- For 2D case, have Gaussian fitting capabilities
 - Decompose detected sources into Gaussian components
 - Functionality comes from casacore library
- Integration with multi-frequency synthesis output

ASKAPsoft development model

- A key aspect of our software development is re-use of third-party packages
- Manpower is limited so make use of existing code rather than create from scratch
 - Imaging based on casacore libraries, fitsio, wcslib, ...
- ASKAP computing team will be responsible for developing the pipeline software.
- SSP members can contribute algorithms or code
 - Provide a 3rd-party library
 - Pass some acceptance test (form to be decided)
 - Pipeline will use library via its API
 - Direct contribution of code to the pipeline itself will only happen in specific circumstances

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Thank you

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