

Prototyping and Production of a Source Finding Pipeline for GASKAP-OH – Pathway to Source Finding in Very Large Datacubes for the SKA – Joanne Dawson

Summary:

The proposal aims to create a spectral-cube source finding pipeline for use with large GASKAP-OH datasets and future SKA datasets. The main aspects of the work are assessing current source finding tools, improving parallelism/throughput, and developing side-lobe rejection algorithms. This ambitious proposal is seeking assistance in the identification of an existing source finder and improving it and integrating it to a larger source-finding pipeline to be fit-for-purpose.

Strengths:

The proposal is well written and organised, addressing all key elements including Translation and Impact.

The development of SKA spectral cubes will be generated by automated pipelines in much the same way as ASKAP, and some level of side-lobe contamination is unavoidable. Thus, the proposal addresses a key challenge and is a good match to multiple requirements from the AusSRC mission statement, benefiting both ASKAP and SKA.

Addressing side-lobe contamination is an important area of research and will improve the science impact of numerous research programs. The proposal has identified viable avenues of exploration, improving its feasibility.

Weaknesses:

The program is quite ambitious as the investigation into existing source finders may find none are ideal. Source finding, particularly adding in some methods for dealing with side lobes is complex and may not be completed in the desired time frame. Added to this is the desire to develop a parallel/HPC friendly pipeline. This will likely require updating the source code of the source finder.

Although significant time has been requested, this might still not be enough. The team and AusSRC will need to collaborate and it will likely need the AusSRC staff to understand the existing codes for OH data processing, along with significant HPC expertise.

The biggest risk is that addressing sidelobe contamination can be quite open-ended with rejection of side-lobes quite dependent on the source finder. There is no guarantee that an optimal approach will be identified so that it can be improved and parallelised.

The proposal would be improved if split into core and exploratory/stretch goals with some attempt at risk mitigation if at a certain point, an optimal approach has not been identified.