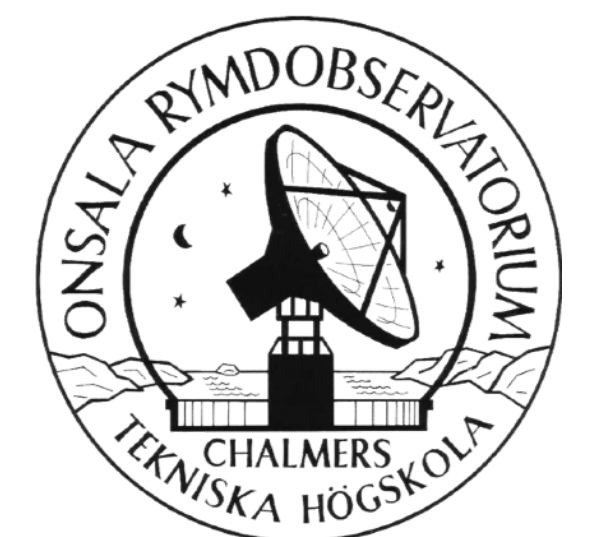# ALMA Array Combination

Some aspects to consider...

MC Toribio
Array Combination workshop - Bologna 2024/10/17

EUROPEAN ARC
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ALMA Array Combination
Astrometry & Flux calibration accuracy

- **Astrometry**

  - See ALMA Technical Handbook, Section 10.5.2 for details on ALMA astrometric accuracy

  - One may take advantage of (known?) positions of very compact sources with high SNR in your field (ie., can be assumed "point source" unresolved for all observations) or extended objects (SSO, evolved stars)

  - One can attempt to make small adjustments and anchor all executions by **imposing an alignment of peak flux positions / source centre** for all the arrays involved (be careful, as you may not be entitled to do so unless the assumption above holds)

  - We can do this by shifting **visibilities** in the Measurement Sets.

  - This strategy has proven useful in the case of fields with QSO, evolved stars, etc.

  - Of course, be extra careful if your source is variable and/or moves (ephemeris), and/or if you are using self-calibration.

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ALMA Array Combination
Astrometry & Flux calibration accuracy

- **Flux calibration**

  - Absolute flux calibration has an inherent uncertainty (could be > 20% in High-Frequencies; see ALMA Technical Handbook, Section 10.4.7)

  - If your source does not vary its flux with time, you can **impose an alignment of peak fluxes** for all Execution Blocks of the same array observation (be careful if there is decorrelation).

  - We can do this by rescaling **visibilities** in the Measurement Sets.

  - This has proven useful for a variety of science cases (star formation regions, evolved stars, fields with QSO, etc).

  - Of course, after this exercise, you should carry the uncertainty to quantities derived from absolute flux measurements of your images.