# EVALUATION OF AN OPEN-SOURCE IMPLEMENTATION OF THE SRP-PHAT ALGORITHM WITHIN THE 2018 LOCATA CHALLENGE

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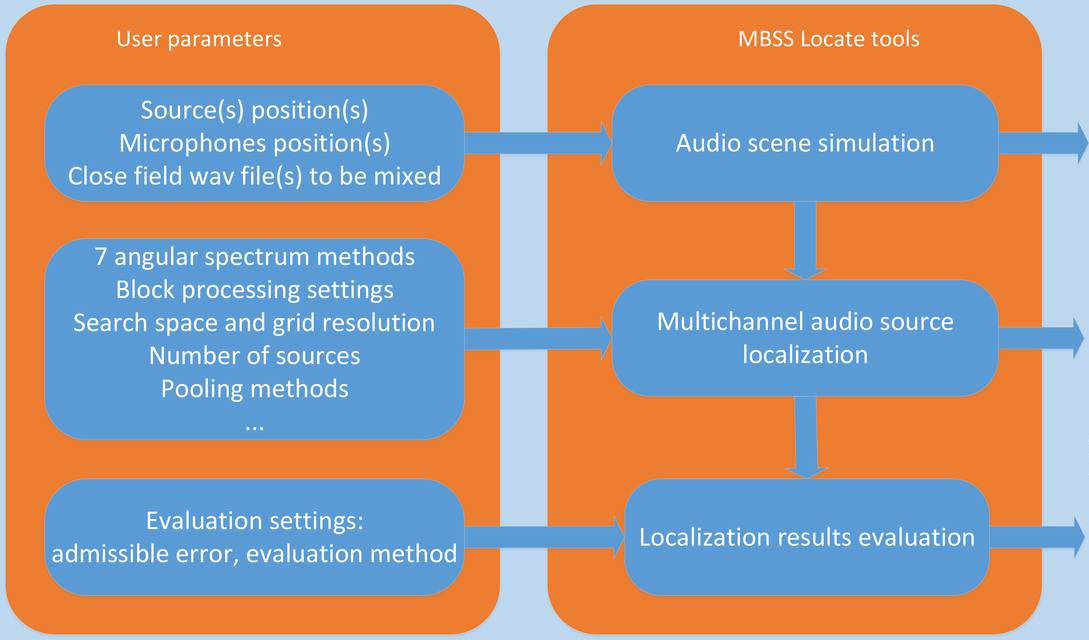
## MBSS Locate : A flexible Matlab toolbox for audio scene simulation, source localization and evaluation

### Features

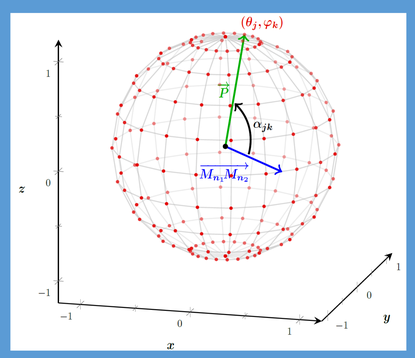
- Audio scene simulation using Roomsimove software
- Multichannel localization by aggregating the angular spectrum response of multiple microphone pairs:
  - handle single or multiple sources;
  - handle static or moving sources and microphones.
- Evaluation results with recall, precision, F-measure and accuracy metrics (based on azimuth, elevation or curvilinear error)

### MBSS Locate usage

- Download the toolbox:
  **http://bass-db.gforge.inria.fr/bss_locate/#mbss_locate**
- Use the web application:
  **https://allgo.inria.fr/app/multichannelbsslocate**

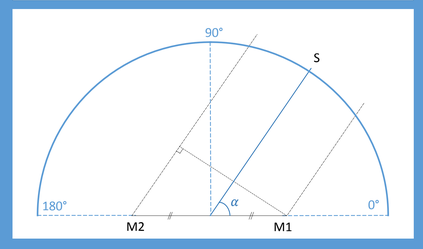



## MBSS Locate evaluation within the LOCATA Challenge: GCC-PHAT extended to the multichannel use case (SRP-PHAT)

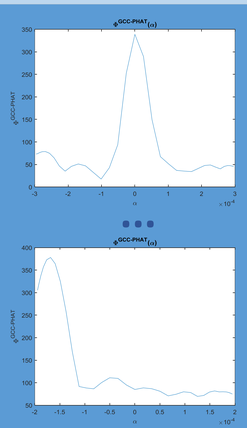



Define the search grid space
(grid of possibles DOAs)

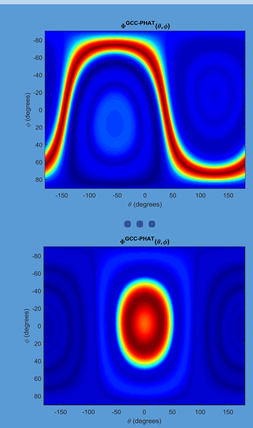
Compute corresponding AOAs and resample them into a smaller set for each microphone pair



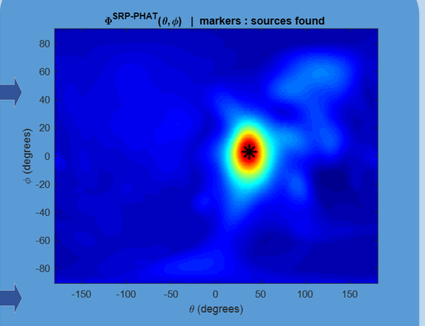

Define a reduced number of AOAs for each microphone pair



Compute GCC-PHAT local angular spectrum on this reduced set



Interpolate the local angular spectra on the entire search grid



Pool local angular spectra over microphone pairs.
Search peak values to find source localization estimates

## LOCATA Challenge Results

Evaluation on Tasks 1, 3 and 5 (single source tasks)

Expressed as success rate (with respect to defined threshold) and absolute localization error in azimuth and elevation

| Success threshold | Task 1: static source / static mics | | | | | | Task 3: moving source / static mics | | | | | | Task 5: moving source / moving mics | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Robot head | | | Eigenmike | | | Robot head | | | Eigenmike | | | Robot head | | | Eigenmike | | |
| | az. | el. | success | az. | el. | success | az. | el. | success | az. | el. | success | az. | el. | success | az. | el. | success |
| No thresh. | 1,51 | 1,71 | - | 7,04 | 4,68 | - | 4,43 | 2,66 | - | 8,79 | 4,41 | - | 6,19 | 3,16 | - | 9,31 | 4,37 | - |
| 20° | 1,43 | 1,66 | **99,9** | 6,95 | 4,64 | **99,9** | 2,48 | 1,75 | 95,8 | 7,82 | 3,12 | 92,5 | 1,76 | 1,83 | 94,5 | 5,84 | 2,94 | 94,8 |
| 10° | 1,43 | 1,66 | **99,9** | 6,95 | 4,64 | **99,9** | 2,35 | 1,56 | 93,7 | 6,27 | 2,4 | 71 | 1,64 | 1,77 | 93,3 | 5,43 | 2,8 | 89,5 |