Important Note : In this new version of the demixing example the names of the scripts have been changed to better reflect what they are doing. The new names are given below

- demixing.py ⇒ shiftphasecenter.py
- demixing1.py ⇒ demixing.py
- demixing2.py ⇒ subtract_from_averaged.py

1 Instructions

Here follow the step by step instructions for demixing a dataset

1. use LofIm
2. Edit NDPPP.parset Autoweight should be on, remove unwanted channels and preflag.

   ```
   msin = L23145_SB030_uv.MS
   msin.autoweight = True
   msin.startchan = 2
   msin.nchan = 60
   msout = L23145_SB030_HydA.MS

   steps = [preflag1]

   preflag1.type=preflagger
   preflag1.corrtype=auto
   ```

3. run NDPPP
4. Edit shiftphasecenter.py

   ```
   msname = 'L23145_SB030_HydA.MS'
   targets = ( ('CasA', 6.123487680622104, 1.0265153995604648),
               ('CygA', 5.233686575770755, 0.7109409582180791) )
   ```

   The target list contains tuples with (name, ra, dec), where ra and dec are in radians.

5. Run the shiftphasecenter.py script
   `python shiftphasecenter.py`
6. Average the three measurement sets L23145_SB030_CasA.MS, L23145_SB030_CygA.MS and L23145_SB030_HydA.MS with NDPPP by editing NDPPP_avg_HydA.parset

   ```
   msin = L23145_SB030_HydA.MS
   msout = L23145_SB030_HydA_avg.MS

   steps = [avg]
   ```

```
avg.type = averager
avg.timestep = 10
avg.freqstep = 60
```

and then running NDPPP

```
NDPPP NDPPP_avg_HydA.parset
```

7. Edit demixing.py

```
msname = 'L23145_SB030_HydA.MS'

avg_msnames = ['L23145_SB030_HydA_avg.MS',
               'L23145_SB030_CygA_avg.MS',
               'L23145_SB030_CasA_avg.MS']

N_channel_per_cell = 60
N_time_per_cell = 10
N_pol = 4
```

8. Run the demixing.py script

```
python demixing.py
```

9. Run BBS on the demixed measurement sets L23145_SB030_CasA_avg_dem.MS L23145_SB030_CygA_avg_dem.MS The data will be calibrated and predicted data will be put in the MODEL_DATA column.

```
makevds <clusterdesc> L23145_SB030_CasA_avg.MS CasA.vds
makevds <clusterdesc> L23145_SB030_CygA_avg.MS CygA.vds
combinevds CasaA.gds CasA.vds
combinevds CygA.gds CygA.vds
calibrate -f --cluster-desc <clusterdesc> --db ldb001 --db-user <username>
   CasA.gds bbs_CasA.parset Ateam_LBA_CC_CasCyg.skymodel $PWD
calibrate -f --cluster-desc <clusterdesc> --db ldb001 --db-user <username>
   CygA.gds bbs_CygA.parset Ateam_LBA_CC_CasCyg.skymodel $PWD
```

10. Subtract the predicted data of the off axis sources from the averaged data of the target field. Edit subtract_from_averaged.py

```
#######################################################
# The averaged data, including the contribution of other sources
msname = 'L23145_SB030_HydA_avg.MS'

# Name of the table containing the mixing matrix
mixingname = 'mixing'

# Names of the measurement sets with predicted data in the MODEL_DATA column
# The predicted data is going to be subtracted from the averaged data
```

```
mspredictnames = ( 'L23145_SB030_CasA_avg_dem.MS', 'L23145_SB030_CygA_avg_dem.MS')

# Output measurment set
msnameout = 'L23145_SB030_HydA_sub.MS'
##########################################################
```

11. Run subtract_from_averaged.py

    ```
    python subtract_from_averaged.py
    ```

    A new measurement set will be created with the name L23145_SB030_HydA_sub.MS

12. Calibrate the Hydra A measurement set

    ```
    makevds <clusterdesc> L23145_SB030_HydA_sub.MS HydA.vds
    combinevds HydA.gds HydA.vds
    calibrate -f --cluster-desc <clusterdesc> --db ldb001 --db-user <username>
       HydA.gds bbs_HydA.parset Hydra_atrous.sky $PWD
    ```

13. Before imaging transfer covariance information to the WEIGHT column

    ```
    python covariance2weight.py L23145_SB030_HydA_sub.MS
    ```