

#####Two step to use ICON:

*****Step 1. Reconstruct Tomogram slice by slice using ICON(mpi version)--generate serial 2D reconstruction named mid*****.mrc

```
mpirun -n $THREADNUM ./ICONmpi $projectionFile $tiltFile $resultPath
$sliceNumber_begin $sliceNumber_end $iteration_time $iteration_beforeICON
$iteration_afterICON $threshold
```

#####The parameters of ICONmpi

- (1)projectionFile -- projection to be reconstructed, whose Mode value should be 0;
- (2)tiltFile -- tilt file;
- (3)resultPath -- the folder where 2D reconstructions goes;
- (4)sliceNumber_begin -- the index of the first slice to be reconstructed (start from 0);
- (5)sliceNumber_end -- the index of the last slice to be reconstructed (start from 0);
- (6)iteration_time -- the total iteration time;
- (7)iteration_beforeICON -- the iteration time of INFR before ICON (to generate an initial reconstruction for ICON , 10~20 is a appropriate range);
- (8)iteration_afterICON -- the iteration time of INFR after ICON (to ensure the accuracy of sampled projections , 10~20 is a appropriate range);
- (9)threshold -- threshold used in ICON, default 0;

Notice: iteration_time = iteration_beforeICON + iteration_ICON + iteration_afterICON

*****Step 2. Copy program "MRCCatch" to resultPath and combine all 2D reconstructions into a 3D reconstruction

```
./MRCCatch $sliceNumber_begin $sliceNumber_end $cutSize $outputFile
```

#####The parameters of MRCCatch

- (1)sliceNumber_begin -- the index of the first slice to be combined (Corresponding to "*****" in "mid*****.mrc");
- (2)sliceNumber_end -- the index of the last slice to be combined (Corresponding to "*****" in "mid*****.mrc");
- (3)cutSize -- the size of Z axis after cutting
- (4)outputFile -- output file