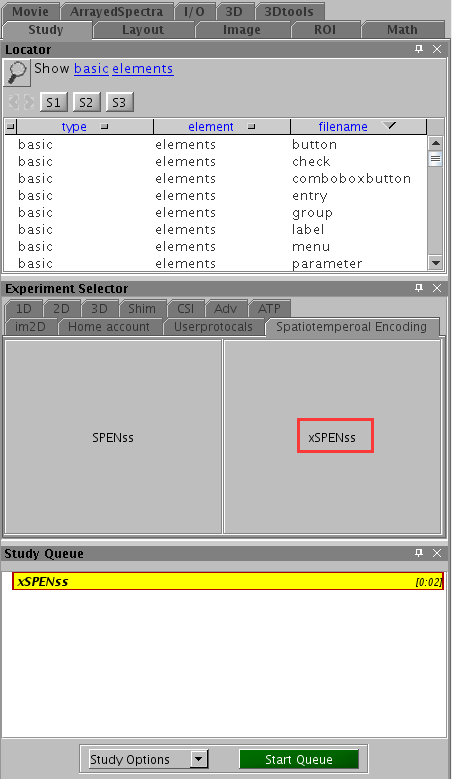
# The package install the single-shot cross-term spatiotemporal encoding (xSPENss) sequence, which supports multi-slicing, segment imaging, array imaging, diffusing etc.

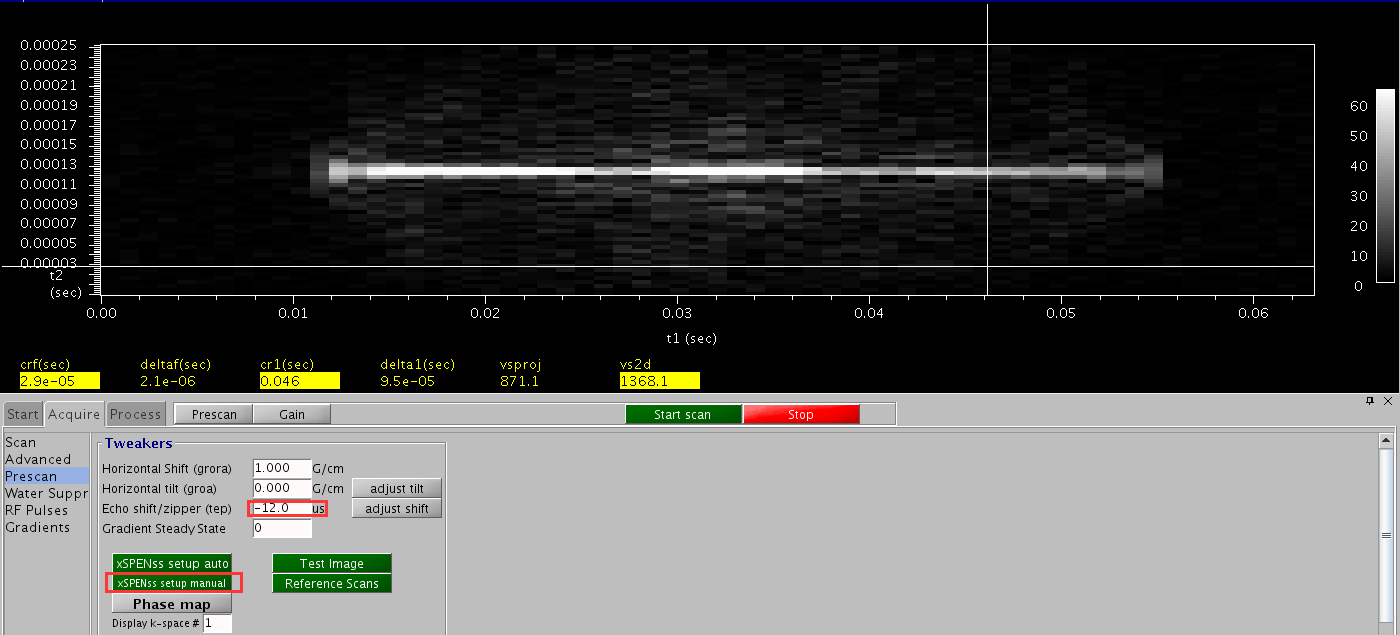
# System requirements: Linux 32 or 64 bits (64 bits recommended), Sequence was tested in VNMRJ3.2 and VNMJ4.0. For on-line processing, the sequence requires the matlab MCR v82, which should be downloaded from MATLAB website during the installation with root permit.

# Contact: [zhiyong.zhang@weizmann.ac.il](mailto:zhiyong.zhang@weizmann.ac.il) or [zhiyongxmu@gmail.com](mailto:zhiyongxmu@gmail.com)

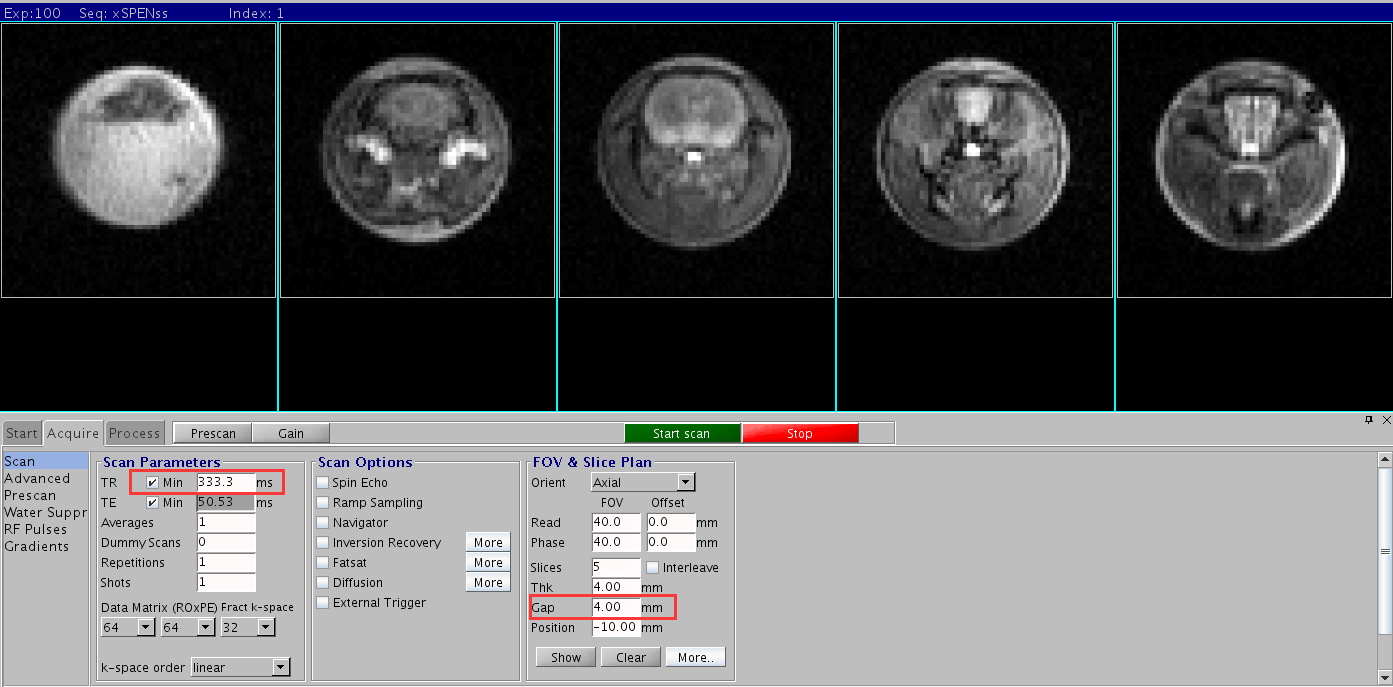
1. Install the package in the terminal, type command “sh /package directory/xSPENssintall.sh”
2. Then open VNMRJ, you will see the xSPENss protocol in the label “Spatiotemporal Encoding” as below:



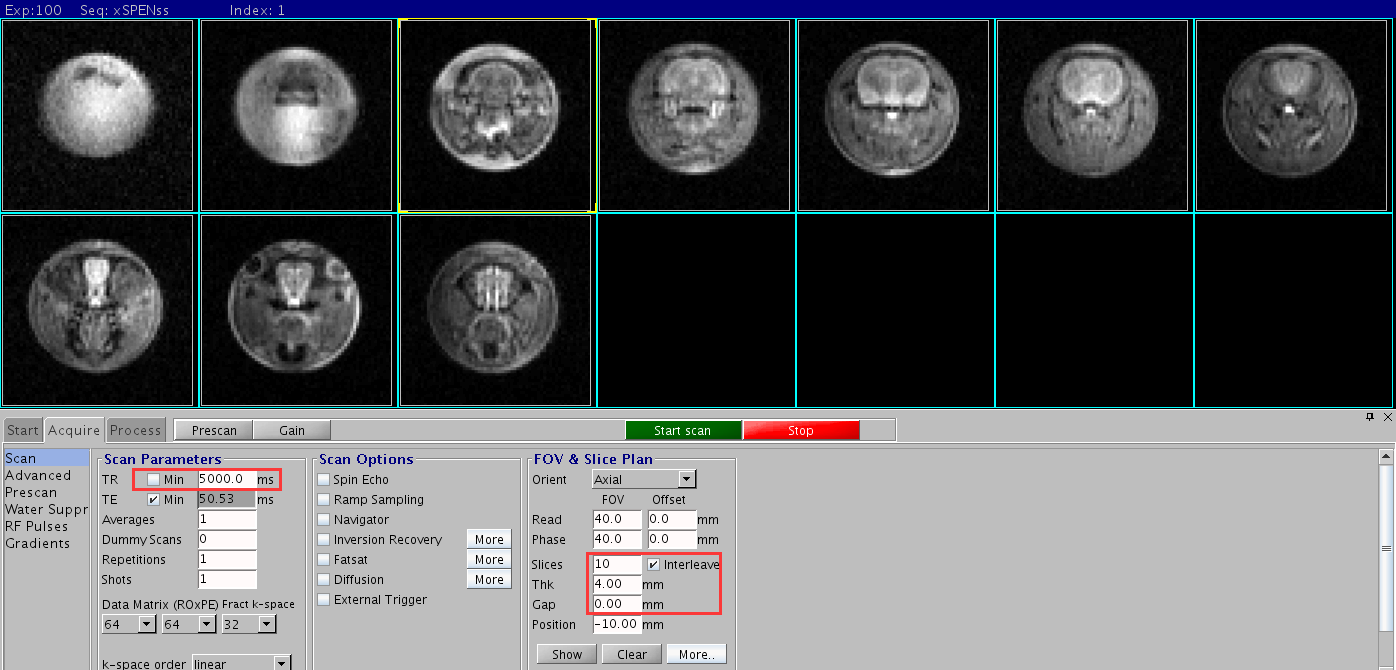
1. The layout is almost same as the EPI’s layout. In the scan options, “Spin Echo” and “Navigator” aren’t working since xSPEN doesn’t need them. The external trigger wasn’t tested.
2. Before run experiments, you should run Acquire/Prescan first to adjust the tep for even/odd acquisition, using “xSPENss setup manual” to manually adjust the tep.



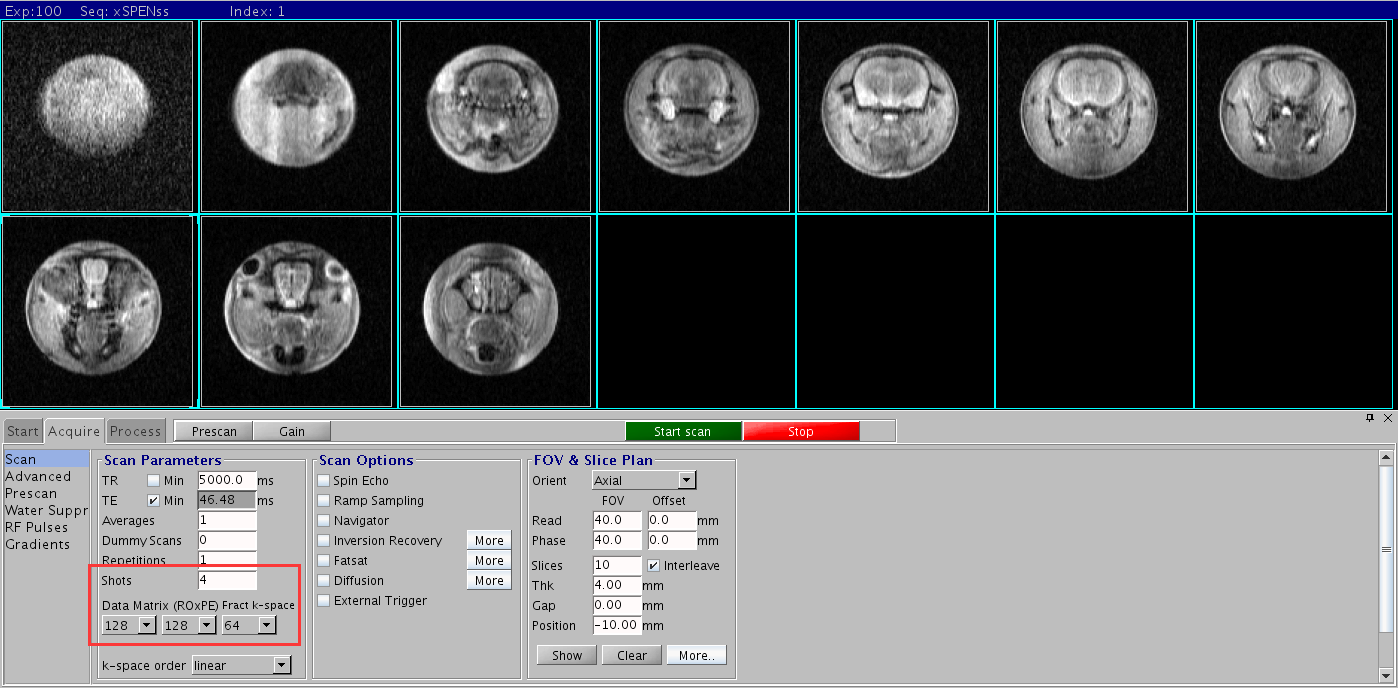
1. Then play with the scan parameters as EPI scans, such as the following experiments using ex-vivo brain in VNMRJ3.2:



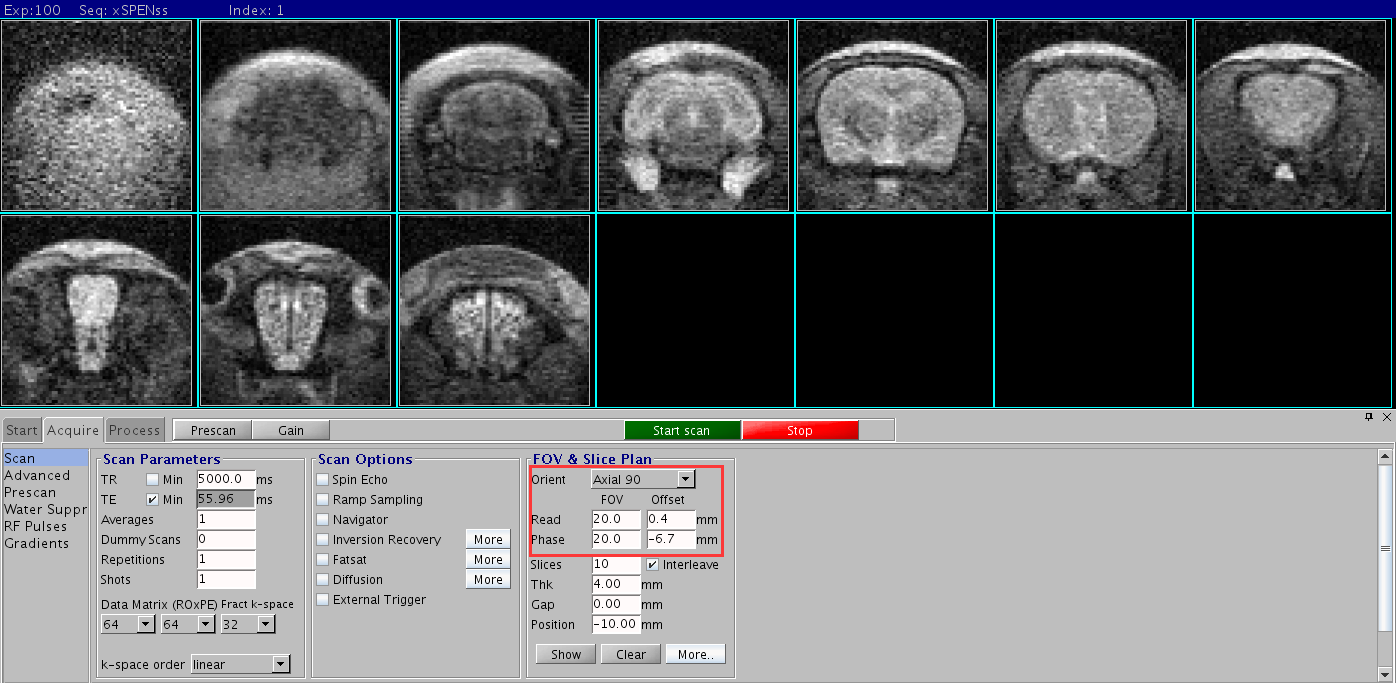
In multi-slicing, the minimum TR requires a gap between slices (no interleave)



In multi-slicing, For TR=5 doesn’t need a gap between slices but with interleaving scan

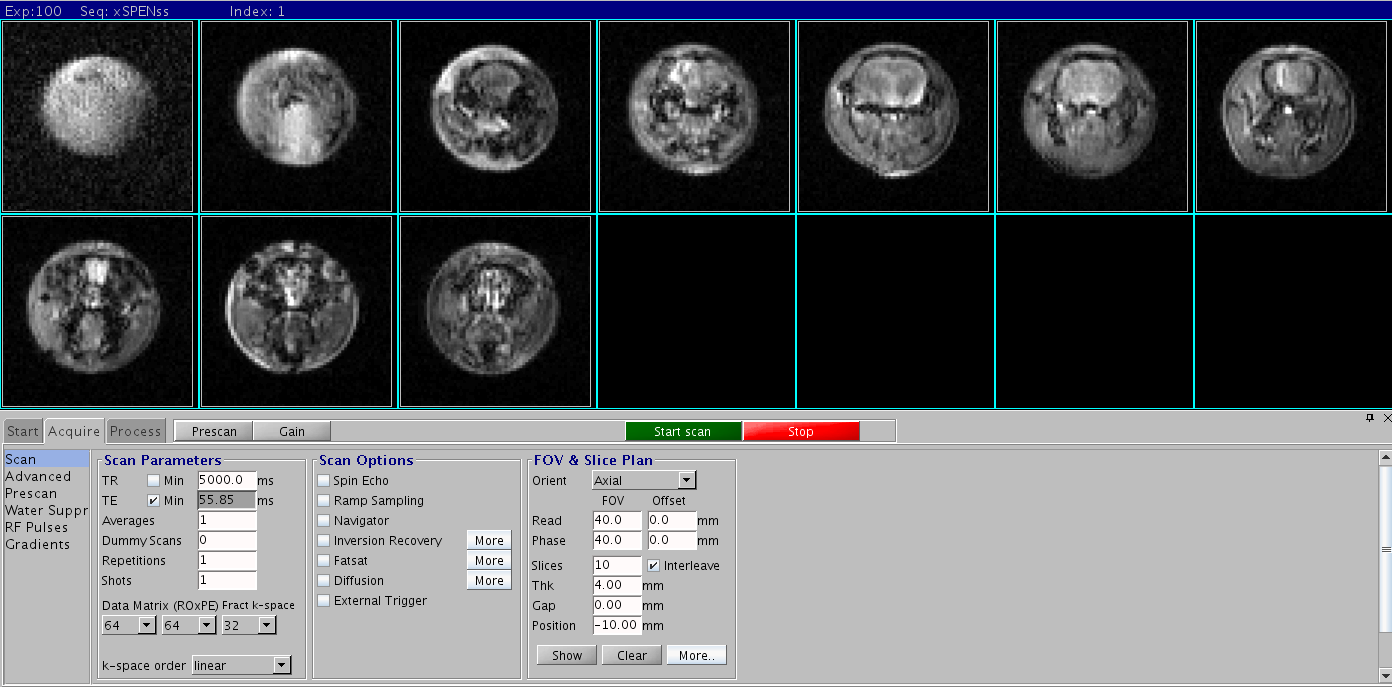


Segment xSPEN, it is a way to increase the resolution



“zoom-in” xSPEN, no folding effect

1. For function xSPEN imaging, please use “Tf” to create the function contrast. Such as set Tf=0.01, we can get the images as following:



Tf=0.01

1. For xSPEN diffusing, please check the diffusion option. Then you can acquire the data, but the processing is not supported yet.

