3. Short-lag spatial coherence (SLSC)

Compare SLSC and B-Mode

You will be given dynamic-receive focused, array channel RF data from a Field II simulated speckle phantom with a -12dB anechoic cyst lesion with radius 0.5 cm.

To that channel data, you should add white noise with 85% bandwidth, centered at 5MHz, using a bandpass filter you will design in Matlab. You may us the Matlab FDATool of the command line filter design functions. Using various levels of noise relative to the channel data from a speckle region, construct SLSC images using the provided Matlab routine and B-Mode images by summing across receive channels.

Use this form of the given SLSC function, where the downsample factor DS should be 1 in this case:

```
[CC] = SLSC(X,K,MAXLAG,DS)
```

Graph the SNR and CNR of SLSC and B-Mode as a function of the noise level.

See the data files, code and papers on CampusNet in the folder “File Sharing”, “exercises”, “exercise_3_coherence_imaging”

[1] Lediju, M. A., Trahey, G. E., Byram, B. C., & Dahl, J. J. (2011). Short-lag spatial coherence of backscattered echoes: imaging characteristics. *Ultrasonics, Ferroelectrics, and Frequency Control, IEEE Transactions on*, *58*(7), 1377-1388.

Advisor: Gregg Trahey, PhD; David Bradway, PhD