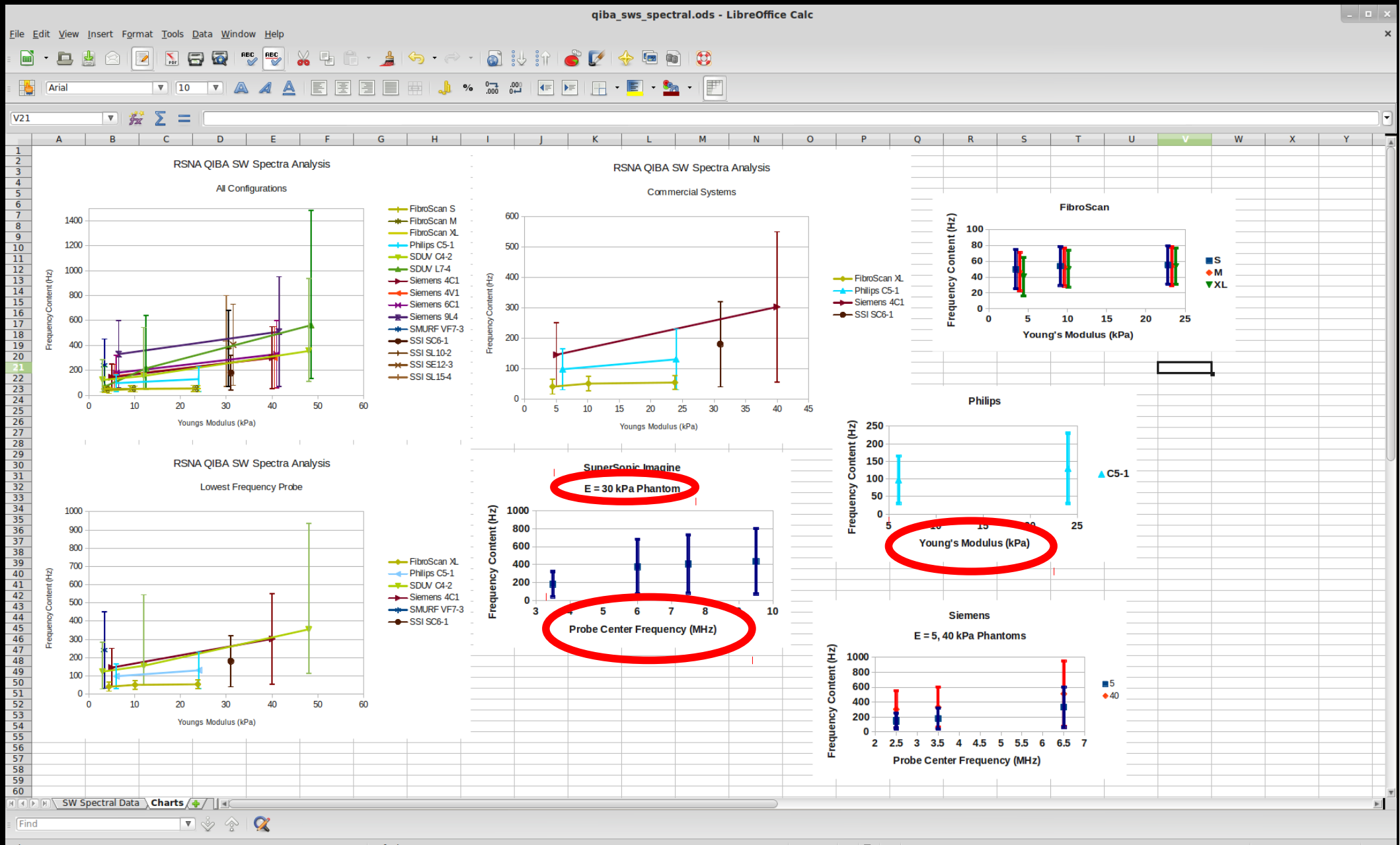
CIRS Elastic Phantom Spectral Data

- Previous effort (Fall 2012) to evaluate spectral data between systems was confounded by:
  - Different phantoms: Stiffness? Viscosity?
  - Different focal depths
  - Non-standard spectral methods
- Opportunity to now standardize that measurement process and re-present that analysis

DUKE BME BIOMEDICAL ENGINEERING Pratt School of Engineering

Quantitative Imaging Biomarkers Alliance RSNA

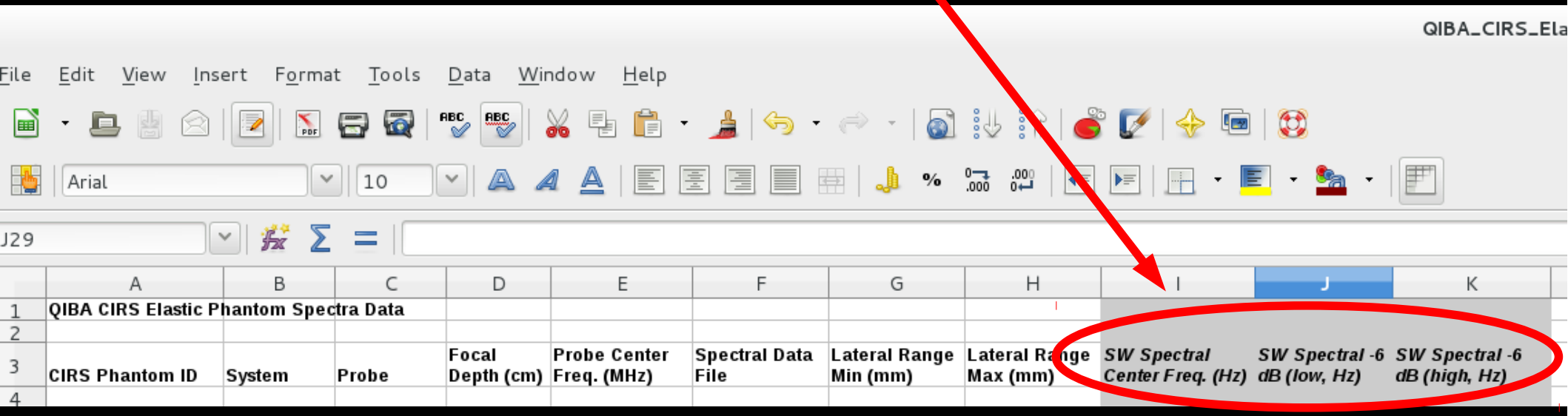
Previous Data (RSNA Poster)



CIRS Elastic Phantom Study

- "Same" two phantoms distributed to each study site
- Standardized focal depths and acquisition methodology

How do we standardize this characterization?



	A	B	C	D	E	F	G	H	I	J	K
1	QIBA CIRS Elastic Phantom Spectra Data										
2											
3	CIRS Phantom ID	System	Probe	Focal Depth (cm)	Probe Center Freq. (MHz)	Spectral Data File	Lateral Range Min (mm)	Lateral Range Max (mm)	SW Spectral Center Freq. (Hz)	SW Spectral -6 dB (low, Hz)	SW Spectral -6 dB (high, Hz)
4											

Spectral Analysis Options

- Each study site sends a common person their data to analyze
  - Mean velocity (differentiated displacement) profiles
  - Apply any proprietary filtering before hand-off
- Standard protocol for each site to perform
  - Metrics to report?
    - Center, -6 dB low / high?
      - What if not symmetric about center frequency?
      - Alternative summary metrics?
    - Raw plots?

CIRS Elastic Phantom FEM Data

https://ultraweb.bme.duke.edu/QIBA/

Wunderground | Ganglia | Ultrasound Wiki | Lab | Prostate Wiki

Index of /QIBA

- Parent Directory
- CIRS_Elastic_FEM_Data.tgz
- CIRS_Elastic_FEM_Data.txt
- CIRS_Elastic_FEM_Data/
- COPYING
- README

Apache/2.2.3 (CentOS) Server at ultraweb.bme.duke.edu Port 443

URL: https://ultraweb.bme.duke.edu/QIBA/
Username: qiba
Password: XXXXXXX

Data Archive Files

https://ultraweb.bme.duke.edu/data/QIBA/CIRS_Elastic_FEM_Data.txt

Wunderground | Ganglia | Ultrasound Wiki | Lab | Prostate Wiki | QIBA | Google Calendar | Mendeley | Import to Mende

```
drwxrwsr-x mlp6/grads        0 2013-05-30 14:45:12 CIRS_Elastic_FEM_Data/
drwxrwsr-x mlp6/grads        0 2013-02-12 21:42:01 CIRS_Elastic_FEM_Data/E3.0kPa/
drwxrwsr-x mlp6/grads        0 2013-02-12 21:42:07 CIRS_Elastic_FEM_Data/E3.0kPa/2.30MHz/
drwxrwsr-x mlp6/grads        0 2013-02-12 21:42:12 CIRS_Elastic_FEM_Data/E3.0kPa/2.30MHz/F4.0/
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drwxr-sr-x mlp6/grads        0 2013-02-14 17:29:26 CIRS_Elastic_FEM_Data/E3.0kPa/2.30MHz/F4.0/FD0.060cm/a0.45/
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drwxr-sr-x mlp6/grads        0 2013-02-14 17:29:26 CIRS_Elastic_FEM_Data/E3.0kPa/2.30MHz/F2.0/FD0.080cm/a0.45/
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```

FEM Model Parameters (README)

https://ultraweb.bme.duke.edu/data/QIBA/README

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```
These are FEM simulations that were done to match the Duke University
measurements of all of the CIRS elastic phantoms.  The following parameters
were using in these simulations:

Transducer:
ARFI Excitation Frequency:
F/#s:
Focal Depths:
Young's Moduli:
Density: 1.0 g/cm^3
Poisson's Ratio: 0.499

FEM Model Details:
```

Example Data File (res_sim.mat)