

**QIBA Ultrasound Shear Wave Speed (SWS) Combined Call:
System Dependencies and Phantom-System Measurement Testing Subcommittees**

Friday, June 6, 2014; 11 AM CT

Call Summary

Notes provided by Dr. Wear

In attendance

Keith Wear, PhD (Co-Chair)

Mark Palmeri, MD, PhD (Co-Chair)

Michael André, PhD

Paul Carson, PhD

Jun Chen, PhD

Shigao Chen, PhD

David Cosgrove, MD

Brian Garra, MD

Gilles Guennette, RDMS, RDCS, RVT

Timothy J. Hall, PhD

Stephen McAleavey, PhD

Yasuo Miyajima, MS

Nicolas Rognin, MSc, PhD

Daniel Sullivan, MD

Matthew Urban, PhD

Michael Wang, PhD, MASC

RSNA

Joe Koudelik

Julie Lisiecki

Moderator: Keith Wear, PhD

Agenda:

1. Review and approval of minutes of previous meeting.
2. Discussion of latest round of CIRS phantoms to be measured by Duke and Mayo (S. Chen).
3. Update on Round IV simulation / phantom proposal from Duke, Mayo, Michigan Tech, U. Rochester (Palmeri)
4. Open Forum

Notes:

1. The call summary from the previous teleconference was approved.
2. Shigao Chen, Mayo Clinic, gave a presentation on a test of the viscous CIRS phantom sample E2170-4. Tests were performed at Duke University and Mayo Clinic. Shear waves were generated using two methods: radiation force and mechanical shaking. Dispersion was measured using a linear fit to phase velocity vs. frequency data. The results suggest that their radiation force measurements are probably reliable between 200 and 600 Hz. Mayo mean dispersion was approximately 1.3 m/s/kHz. However, Duke mean dispersion was approximately 5 m/s/kHz. The two groups used different frequency ranges for analysis. There was a discussion regarding the appropriate frequency range over which to analyze the phase velocity vs. frequency data. Measurements of dispersion depend sensitively on frequency band of analysis. It was suggested that simulation analysis may help guide the proper choice of frequency range. The current CIRS phantom recipe seems promising. Ted Lynch of CIRS will make another set of phantoms to see how consistent the manufacturing process is.
3. Mark Palmeri gave an update on Round IV simulation / phantom proposal from Duke, Mayo, Michigan Tech, U. Rochester. Mark gave an overview of the 2014-2015 funding proposal: "Development and validation of simulations and phantoms mimicking the 4 viscoelastic properties of human liver." Round III involved producing tools and datasets corresponding to the Phase I phantoms. The proposed deliverables for Round IV are
 - a. provide recommended VE analysis /reporting method and metrics, as validated by the simulations applied to the phantom and potential human data,
 - b. test and analyze Phase II phantom samples as CIRS/UWM iterate on phantom recipes and determine the "best" recipe for viscoelastic phantom fabrication and distribution,
 - c. create and upload simulation data matching the phase II phantom and a variety of focal configurations,
 - d. determine the "best" viscoelastic material models and constants to match the phase II phantoms and human liver data, and
 - e. provide validated open source alternatives to commercial FEA packages. Benchmark results for phase II phantoms will be documented and supplied

Mark has been posting Phase I data on the Duke server. As more data become available, the size of the dataset becomes more difficult to manage. So we need to investigate what is the best way to make data available.

Toshiba, GE, Siemens, and Philips have all indicated that they are willing to participate to some extent in sharing IQ data and acquisition parameters. But the exact nature of that participation is still uncertain at this time.

Remaining June Calls:

- Friday, **June 13, 2014**: US SWS Technical Committee Call – Dr. Garra – *TBD if needed at UITC meeting*
- Friday, **June 20, 2014**: Systems/ Phantom SC – Dr. Palmeri
- Friday, **June 27, 2014**: Clinical SC – Dr. Samir

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