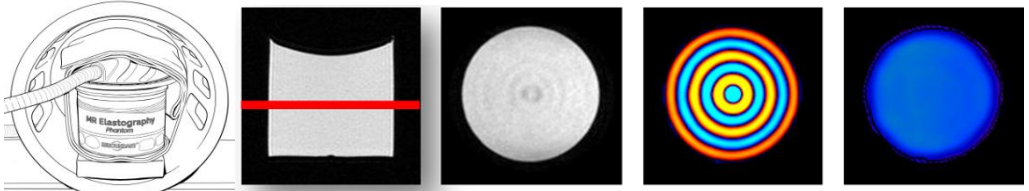


## MR Elastography Phantom

### Scanning Parameter Recommendations

- To set-up the phantom for scanning, refer to the illustrations in the MRE PHANTOM USER GUIDE included with each MRE Phantom.
- Use the following recommended MRE Phantom imaging parameters that are specific to your GE MR scanner.

| GE - 2D MRE Phantom Parameter Recommendations |  |  |   |
|---|--|--|---|
| <b>Scanners and Sequences (Note 1)</b>        | Scanner  | Artist, Creator, Explorer, HDx, Optima MR450w, Voyager | Architect, Discovery MR750w, PET/MR, Pioneer, Premier |
|   | Field Strength   | 1.5T   | 3T  |
|   | Software versions (Compatible)   | >DV22.1  | >DV22.1DV26   |
|   | Pulse sequence   | MR-Touch (GRE)   | MR-Touch (EPI)  |
|   | Mode   | 2D   | 2D  |
|   | Options  | Fast, ASSET, MultiPhase                                | ASSET, FC, MultiPhase                                 |
| <b>Phantom Setup</b>                          | Phantom Setup  | See MRE PHANTOM USER GUIDE with Phantom Kit.           |   |
|   | Coil (Note 2)  | Head or Torso/Spine                                    |   |
| <b>Slice Positioning</b>                      | Place one coronal slice at the center of the height of the phantom                   |  |   |
|   |  |  |   |
| <b>Information Input (Pretest Patient)</b>    | Position   | feet-first, supine                                     | feet-first, supine                                    |
|   | Weight   | 150 Lbs (68 kg)  | 150 Lbs (68 kg)                                       |
|   | Height   | 5 ft (1.5 m)   | 5 ft (1.5 m)  |
| <b>Imaging Parameters</b>                     | Imaging Plane  | coronal  | coronal   |
|   | Number of slices   | 4  | 4   |
|   | Slice thickness (mm)/gap   | 10 mm / 0 mm   | 8 mm / 2 mm   |
|   | FOV (mm) / Phase FOV (100%) (Note 3)   | 42 cm/100%   | 42 cm/100%  |
|   | Matrix   | 256 x 64   | 96 x 96   |
|   | TE (msec)  | min full TE (typically ~18.2)                          | min full (around 57.6 msec)                           |
|   | TR (msec)  | 50   | 250   |
| Flip Angle (degree)                           | 25   | 90 (default)   |   |

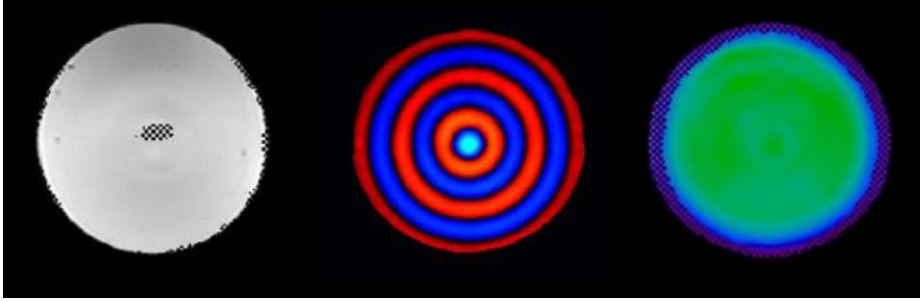
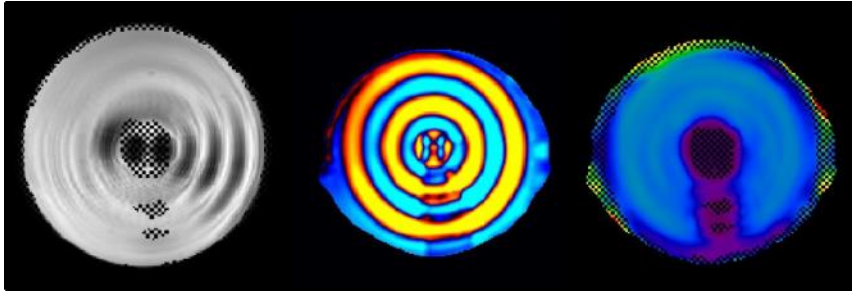
|   |                               |   |   |
|---|-------------------------------|---|---|
| <b>Imaging Parameters</b>   | NEX                           | 1   | 1   |
|   | EPI shots                     | N/A                                       | 1   |
|   | Bandwidth (kHz)               | 31.25                                     | 250 (hard coded)                          |
|   | Freq Encoding Dir             | Superior-Inferior                         | Superior-Inferior                         |
|   | Phase Acq. Order              | N/A                                       | N/A                                       |
|   | Delay After Acq.              | N/A                                       | N/A                                       |
|   | Acceleration (Note 4)         | ASSET                                     | ASSET                                     |
|   | Acceleration factor (Note 4)  | 1   | 2   |
|   | Number of breath holds        | N/A                                       | N/A                                       |
|   | Shimming Volume               | Cover the whole phantom                   | Cover the whole phantom                   |
|   | Spectrum Peaks                | Peak with middle freq (there are 3 peaks) | Peak with middle freq (there are 3 peaks) |
|   | Saturation Band               | SI  | SI  |
|   | Scan Time                     | about 28 sec (Note 2)                     | 10 sec                                    |
| <b>MR-Touch Tab (Note 1)</b>  | Temporal Phases               | 4   | 4   |
|   | MEG Frequency (Hz)            | 75  | 90  |
|   | Driver Frequency (Hz)         | 60  | 60  |
|   | Driver Amplitude (%) (Note 6) | 10  | 10  |
|   | MEG Direction                 | Z   | Z   |
| <b>NOTES:</b>   |                               |   |   |
| (1) Specific tab and parameters vary based on different software versions and MRE sequences; the generic MRE parameters for driver and motion encoding gradients are the guideline to those specific tab and parameters (MRE-related); overall, this recommendation is conservative so that it can be successfully performed at all software versions and scanners. |                               |   |   |
| (2) Use of a multi-channel RX head coil is preferred. Alternatively, the Torso/Spine coils can be used.   |                               |   |   |
| (3) 20cm FOV is a minimum value for phantom studies, smaller FOVs may reduce SNR or confidence and should be avoided. Larger FOV may be used and may be beneficial for correlation to in vivo scans.  |                               |   |   |
| (4) ASSET acceleration factor R = 1 is recommended for GRE, while R = 2 for EPI to allow shorter TE. R > 1 can be used generally, particularly for correlation to in vivo sequences. Larger FOVs may be desirable to avoid aliasing artifacts.  |                               |   |   |

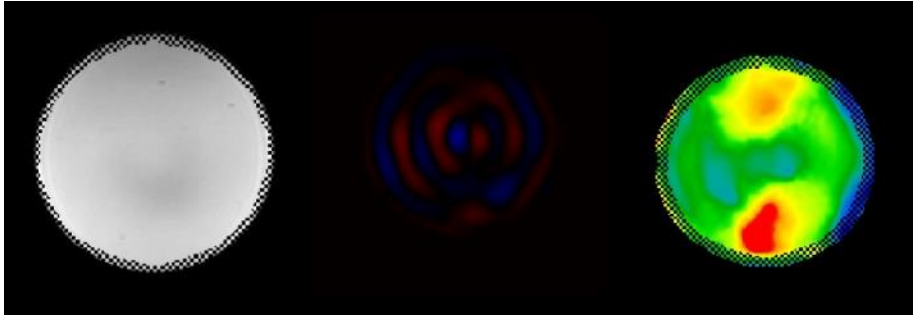
**Questions** - Questions regarding the Resoundant MRE Phantom Scanning Parameter Recommendations may be directed to:

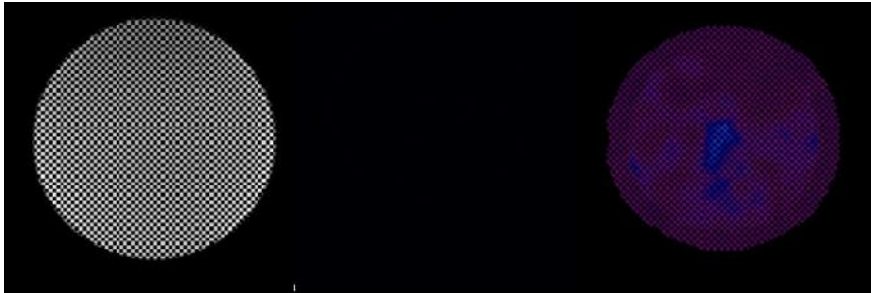
Resoundant, Inc.  
421 First Avenue SW STE 204W  
Rochester, Minnesota 55902 USA  
Phone: 507.322.0011  
Email: [mreinfo@resoundant.com](mailto:mreinfo@resoundant.com)

## Phantom Scanning Results

The following table outlines the expected phantom scanning results, including sample images, visual descriptions, and troubleshooting tips.

| Normal Phantom Scan Results                  |  |  |  |
|--|--|--|--|
| Magnitude, Wave, and Color Elastogram images |    |  |  |
| Qualitative Description of Results           | Magnitude Image  | Wave Image   | Elastogram   |
|  | <ul style="list-style-type: none"> <li>No “ripples” or motion present.</li> <li>Circular, homogeneous appearance (may see slight distortion from EPI-based sequences)</li> </ul> | <ul style="list-style-type: none"> <li>Red/blue waves</li> <li>Concentric circles</li> </ul> | <ul style="list-style-type: none"> <li>Large region of high confidence</li> <li>May see confidence hatch out on edges or in the very center. This is acceptable</li> </ul> |
| Amplitude Too High                           |  |  |  |
| Magnitude, Wave, and Color Elastogram images |    |  |  |
| Qualitative Description of Results           | Magnitude Image  | Wave Image   | Elastogram   |
|  | <ul style="list-style-type: none"> <li>“Ripples” or motion present (phase dispersion).</li> </ul>  | <ul style="list-style-type: none"> <li>Wave images oversaturated</li> </ul>                  | <ul style="list-style-type: none"> <li>Stiffness irregular</li> </ul>  |
| Troubleshooting Tips                         | Decrease amplitude to 5-10%.   |  |  |

| Amplitude Too Low                            |   |  |   |
|--|---|--|---|
| Magnitude, Wave, and Color Elastogram images |   |  |   |
| Qualitative Description of Results           | Magnitude Image   | Wave Image   | Elastogram  |
|  |   | <ul style="list-style-type: none"> <li>Wave images undersaturated/black</li> </ul> | <ul style="list-style-type: none"> <li>Stiffness irregular</li> </ul> |
| Troubleshooting Tips                         | <p>Confirm proper phantom set-up: passive driver secured tightly to phantom with belt, tube connected between active and passive driver.</p> <p>May be due to leak in tubing or passive driver, or active driver failing.</p> |  |   |

| No Amplitude                                 |   |  |  |
|--|---|--|--|
| Magnitude, Wave, and Color Elastogram images |   |  |  |
| Qualitative Description of Results           | Magnitude Image   | Wave Image   | Elastogram   |
|  |   | <ul style="list-style-type: none"> <li>No waves</li> </ul> | <ul style="list-style-type: none"> <li>No regions of high confidence (completely hatched out)</li> </ul> |
| Troubleshooting Tips                         | <p>Confirm the active driver is on and amplitude set to 5-10%.</p> <p>Confirm tube between active and passive driver is connected.</p> <p>May be due to active or passive driver failure.</p> |  |  |