

Acoustic Range Estimates plans to hire a recent BME or physics graduate willing to make a 2-year commitment. The position would provide experience with proton therapy & diagnostic imaging, esp. ultrasound, CT, & MRI, and be a good stepping-stone before starting a medical physics graduate program in 2024.

Specific aims page is attached to give an overview, and some details can be found on my academic web page <https://sites.uwm.edu/patches/thermoacoustic-range-verification-during-particle-therapy/> More recent results are posted to LinkedIn <https://www.linkedin.com/company/77825732/admin/>

Examples of short-term tasks include

1. get positional and listener packages working on Clarius wireless ultrasound arrays, then teach boss (me) how to use them.
2. improve/modify 3D printed clamp (Fig. 1) that secures thermoacoustic Rx, DAQ, compact radiation detector, & batteries to Clarius P4-1 ultrasound array.

Longer term, this person will perform hands on bench work at mHUB <https://mhucbicago.com> and collect data at proton therapy centers, probably starting with WashU in St Louis.

Once a prototype design is finalized, the hire may be asked to travel to particle therapy centers (see maps below) to demonstrate for clinicians and gather feedback for future improvements.

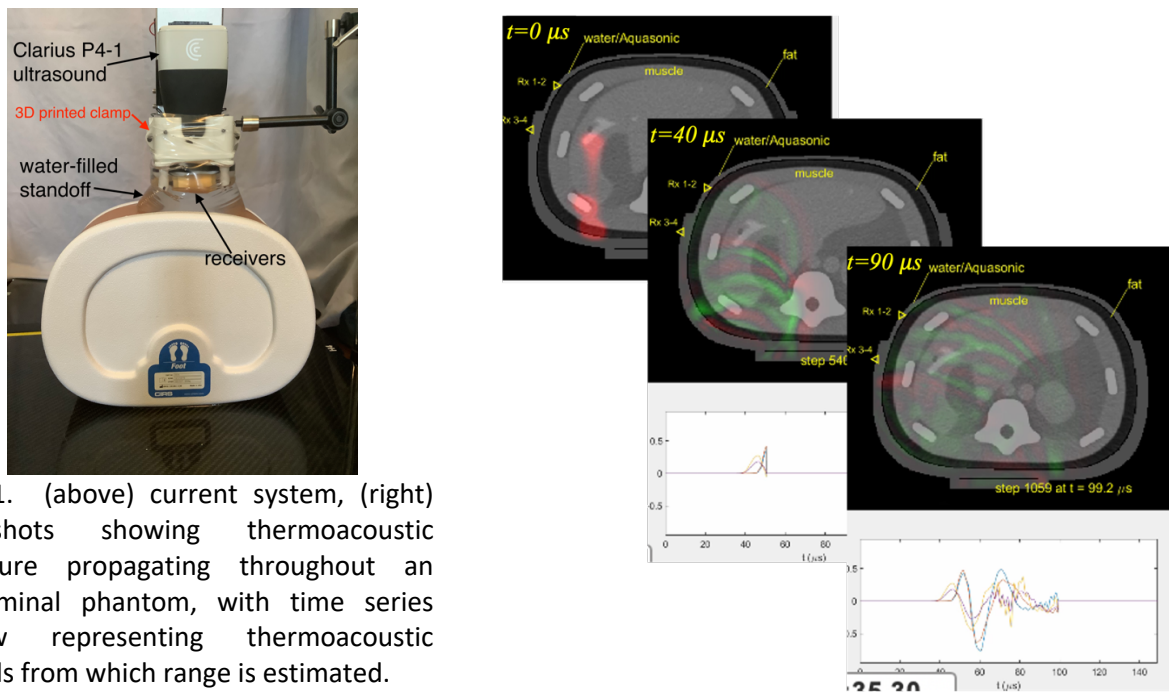


Fig. 1. (above) current system, (right) snapshots showing thermoacoustic pressure propagating throughout an abdominal phantom, with time series below representing thermoacoustic signals from which range is estimated.

Notes:

1. This position is pending final approval of funding from NIH. An intent to fund notice for a Phase II SBIR application was received Jan 19. Final review should be completed March, 2022.
2. Proton therapy systems aren't following Moore's Law, but they come close. Just a few years ago, 4-room systems with synchrotron or isochronous cyclotron accelerators cost \$200M. Today, single-room systems with lighter & cheaper synchrocyclotron accelerators cost \$25M. DOE is investing in research to reduce the cost of the next most expensive component, which will drive prices down even more – and increase the installed base. Maps in Fig. 2 show current installations of carbon ion systems (blue) and proton therapy systems (orange).

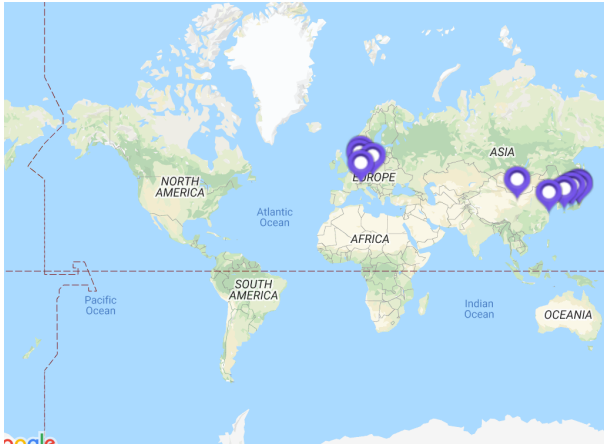


Fig 2. Carbon ion is available only in Europe & Asia. Proton therapy is available in N Hemisphere.