

MP/RI hybride scanner: open-sided MPI & low-field MRI

Magnetic Particle Imaging (MPI) is an emerging medical imaging modality that images magnetic nanoparticles introduced into the human body. Since the imaging signal originates solely from these nanoparticles and not from biological tissues, MPI provides high contrast and sensitivity. However, background anatomical information is required for many clinical applications. To address this limitation, hybrid CT/MPI and MRI/MPI systems have been

proposed, which combine the high contrast and sensitivity of MPI with background anatomy. Hybrid MRI/MPI is a good combination because both utilize compatible magnetic fields and also non-ionizing radiation.

Previously, our team developed the world's first open-sided field-free-line MPI scanner. By integrating LF-MRI functionality into the existing MPI hardware, we transformed this device into a hybrid MPI and LF-MRI scanner. In this webinar, I will present the design of our original MPI system, review related work, and explain the key steps required to convert it into a hybrid scanner. Finally, I will present results from phantom studies, demonstrating that our

system successfully performs simultaneous imaging with a 50 mT B₀ field for MRI and a 0.35 T/m gradient for MPI.