

**Mobile EM Field Generator for Ultrasound Guided Navigated Needle Insertions**

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Needle insertions are an elementary tool for diagnostic and therapeutic purposes. Critical success factors are: Precise needle placement, avoidance of critical structures and short intervention time. Navigation solutions for ultrasound-based needle insertions have been presented but did not find widespread clinical application. This can be attributed to the complexity and higher costs introduced by additional tracking related equipment. Using a new compact electromagnetic (EM) field generator (FG), we present the first navigated intervention method that combines field generator and ultrasound (US) probe into a single mobile imaging modality that enables tracking of needle and patient. In a phantom study, we applied the system for navigated needle insertion and achieving a hit rate of 92% and a mean accuracy of 3.1 mm (n=24). These results demonstrate the potential of the new combined modality in facilitating US-guided needle insertion.

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