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**Adaptive focusing for bone and motion artifacts corrections in**  
**High Intensity Focused Ultrasound Therapy**

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Despite extensive and fast progress of HIFU clinical applications, many issues still need to be addressed. Distortions caused by defocusing obstacles, such as the skull or ribs, on the ultrasonic therapeutic beam are still being investigated. Multi-element transducer technology must be used in order to achieve such transcranial or transcostal adaptive focusing. Secondly, the problem of motion artifacts, a key component in the treatment of abdominal lesions, has been shown to significantly influence the efficacy and treatment time. Though many methods have been proposed for the detection of organ motion, little work has been done to develop a comprehensive solution including motion tracking and feedback correction in real time. This paper is a review of the work achieved by authors in transcranial HIFU, transcostal HIFU and motion compensated HIFU. For these three issues, the optimal solution can be reached using the same technology of multi-element transducers devices able to work both in Transmit and Receive modes.