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Room 430

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Abstract

Ultrasound imaging plays an important role in biomedical diagnostics due its safety, noninvasive nature, and low cost. Conventional ultrasound systems typically form an image frame by scanning the region of interest line-by-line, using a focused beam during transmission and dynamic focusing during reception. Alternatively, the region of interest can be insonified at once using a plane wave, which allows for ultrafast data acquisition rates but reduces the resulting image quality. The latter can be improved by means of coherent plane-wave compounding (CPWC), whereby multiple plane waves are emitted at different angles to obtain multiple image datasets that are subsequently combined to enhance the final compounded image.

We present two novel Fourier-domain techniques for CPWC image reconstruction from raw linear-array sensor data. In particular, we show how to modify two classic algorithms used for geophysical data processing, namely Stolt's and slant-stack depth migration under zero-offset constant-velocity assumptions, so that their new versions become applicable to plane-wave ultrasound data processing. To demonstrate the merits and limitations of our approach, we provide qualitative and quantitative me