Photo-Acoustic Imaging Using Nanoparticles

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Abstract: We propose an approach for the simultaneous reconstruction of the electromagnetic and acoustic material parameters, in the given medium where to image, using the photo-acoustic pressure generated by plasmonic nanoparticles. We show that the generated pressure, measured on a single point away from the target during a large enough time interval and using a suitable band of electromagnetic incident frequencies, is enough to reconstruct the sound speed, the mass density and the permittivity. Details can be seen in [1] and [2].

[1] A. Ghandriche and M. Sini; Simultaneous Reconstruction of Optical and Acoustical Properties in Photo-Acoustic Imaging using plasmonics. arXiv:2209.08482

[2]. A. Ghandriche and M. Sini; Photo-acoustic inversion using plasmonic contrast agents: The full Maxwell model. J. Differential Equations 341 (2022), 1–78.