

## **Reflection Matrix Approaches for Imaging: From Ultrasound to Optics**

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Noninvasive *in vivo* medical imaging with light or with ultrasound requires reflection-mode detection. As tissues are complex disordered media and contain random distribution of scatterers, these techniques suffer from various limitations such as distortion induced by aberrating layers as well as multiple scattering contributions. Multi-illumination strategy is the solution to these problems. The speaker will show that recording a time-gated reflection matrix can provide enough information on the properties of aberrating layers and on the level of multiple scattering. The speaker will show how to extract enough information from the coherence properties of this reflection matrix to compensate the effects of aberrating layers and to overcome the contribution of multiple scattering. Various strategies to measure this reflection matrix will be discussed and their applications will be presented in ultrasonic imaging and in deep optical coherent tomography (OCT).