18p-C4-9

Hyperspectral holographic imaging of brain tissues using swept-source diffraction phase microscopy

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We present hyperspectral holographic imaging of mouse brain tissues. Full-field optical amplitude and phase-delay images of a thin slice of mouse brain tissues are measured in the wavelengths ranging from 450 nm to 650 nm. To quantitatively and precisely measure the hyperspectral holographic imaging, we employed a recently develop swept-source diffraction phase microscopy [1, 2], which is composed of a custom-built wavelength-sweeping unit equipped with a supercontinuum source and diffraction phase microscopy, a common-path quantitative phase imaging system. We envision the present approach can provide a method for label-free quantification and diagnosis for biological tissue samples.

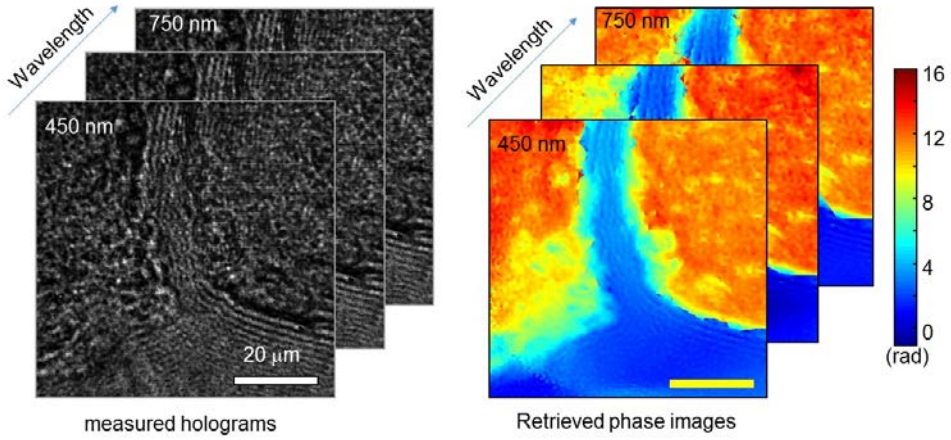

Figure 1. (A) The measured raw holograms illuminated with various wavelengths. (B) The quantitative phase images are retrieved from the hologram using a phase retrieval algorithm. The phase images show the central region of a mouse brain section. The different phase values for various illumination wavelengths indicates the strong dispersion in the brain tissue.

REFERENCES

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