Berner
Fachhochschule

Research Group HuCE-*optoLab*

HYDRA Dual Wavelength OCT

Project Description

At HuCE-optoLab the Spectralis® OCT System (Optical Coherence Tomography) from Heidelberg Engineering SA was extended by a second OCT at 1060 nm wavelength. The device is capable of acquiring tomograms of the retina at identical positions and at the same time but at different wavelengths. Moreover, with Heidelebrg's tracking system one can register tomograms acquired at different times at the same position in the retina.

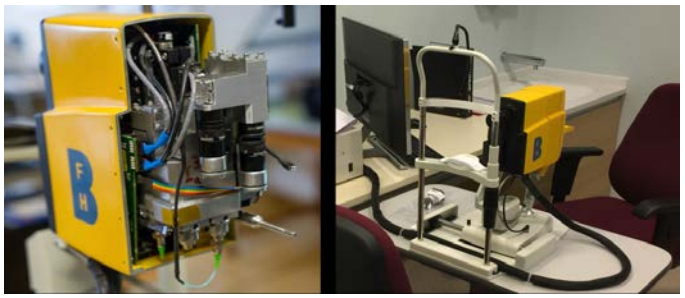

Fig 1: Transformed Heidelberg Engineering Spectralis® Hydra

For this purpose we developed a dedicated spectrometer precisely adapted at the broadband SLED source (Exalos). The supplementary OCT system is fully integrated in the existing software environment, thus the ophthalmologist can operate the Spectralis in its usual manner. Integration of two OCTs required the development of a very compact dual free space interferometer I³ (Incredibly Integrated Interferometer) also containing two automated reference arms and the original galvo-scanner.

Fig 2: 800 & 1060nm free beam interferometer with fiber coupling, reference arm and two axis galvo-scanner

The HYDRA Dual Wavelength OCT is deployed in a research project on myopia (SNF, Characterization of choroidal changes in children and its temporal response to optical defocus) to determine choroidal thickness and its changes. Other clinical studies utilizing the unique features of the device are planned.

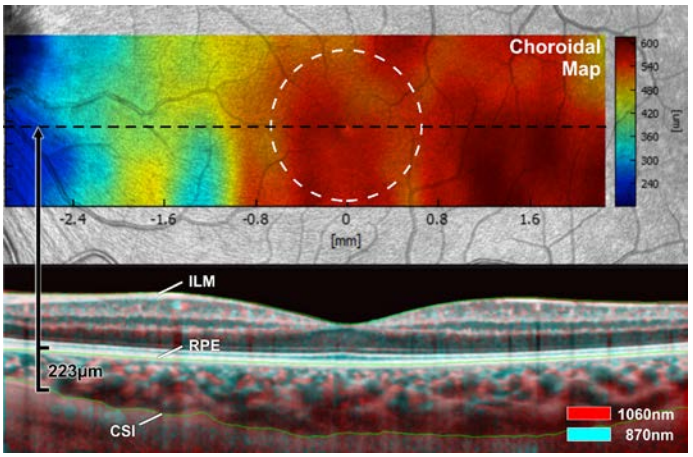

Fig 3: Two OCT B-scans at 1060nm and 870nm as well as the SLO-fundus image with thickness map of the choroid.

Projekt Partner

SNF, Schweizerischer Nationalfonds
Heidelberg Engineering GmbH
The Hong Kong Polytechnic University (PolyU)
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