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Potential use of combining the diffusion equation with the free Shrödinger equation to improve the Optical Coherence Tomography image analysis[1] DELIA CABRERA FERNANDEZ, HARRY M. SALINAS, Bascom Palmer Eye Institute, Miami, FL, GABOR SOMFAI, Semmelweis University, Dept. of Ophthalmology, Hungary, CARMEN A. PULIAFITO, Bascom Palmer Eye Institute, Miami, FL, OPHTHALMIC IMAGING GROUP, BASCOM PALMER EYE INSTITUTE TEAM, DEPT OF OPHTHALMOLOGY, SEMMELWEIS UNIVERSITY COLLABORATION — Optical coherence tomography (OCT) is a rapidly emerging medical imaging technology. In ophthalmology, OCT is a powerful tool because it enables visualization of the cross sectional structure of the retina and anterior eye with higher resolutions than any other non-invasive imaging modality. Furthermore, OCT image information can be quantitatively analyzed, enabling objective assessment of features such as macular edema and diabetes retinopathy. We present specific improvements in the quantitative analysis of the OCT system, by combining the diffusion equation with the free Shrödinger equation. In such formulation, important features of the image can be extracted by extending the analysis from the real axis to the complex domain. Experimental results indicate that our proposed novel approach has good performance in speckle noise removal, enhancement and segmentation of the various cellular layers of the retina using the OCT system.

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