Our analysis demonstrates that the relation between the slope of the OCT signal in depth and the attenuation coefficient is complex. Although biological tissue does not consist of individual particles, but rather a continuous distribution of refractive index variations, the effect of disease state is regularly quantified based on the OCT attenuation coefficient in a number of studies [26, 27, 28]. The value of our work for these studies is that the use of a more advanced model, which takes into account the effect of multiple scattering, can lead to a more accurate determination of the optical properties of tissue. Although, the correct fitting of these models to the data requires additional information, as we we have shown, this information can be obtained from the height of the OCT signal [2] or from spectrally resolved measurements [1]. We expect that the application of these more advanced OCT signal models in clinical light scattering studies can improve the diagnostic value of these optical biopsies.

5. Conclusion

In conclusion, we have shown measurements of concentration dependent scattering coefficients using transmission OCT that are in good agreement with analytical theory. Based on the measured concentration dependent scattering coefficients we validated the EHF model of the backscattering OCT signal for large particles.

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