A COMPARISON OF AXIAL RESPONSES OF ORTHOGONAL LINEARLY POLARIZED AND PARALLEL LINEARLY POLARIZED ZEEMAN LASER SCANNING CONFOCAL MICROSCOPES

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When imaging in a thick specimen, the specimen-induced spherical aberration introduced by refractive-index mismatch clearly degrades the axial response of a confocal microscope. Previous research \cite{1,2} verified that a Zeeman laser scanning confocal microscope (ZLSCM) can reduce the specimen-induced spherical aberration due to the features of common-path propagation of p- and s-polarized waves and heterodyne detection. In the meantime, the scattering effect is reduced due to the spatial coherence gating, polarization gating and spatial filtering gating simultaneously. Experimentally, the axial response of the parallel linearly polarized ZLSCM is superior to the orthogonal linearly polarized ZLSCM under weak spherical aberration condition. However, the opposite conclusion becomes under strong spherical aberration. Hence, a better section image ability by the orthogonal linearly polarized ZLSCM is anticipated when probing a thick specimen.

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Reference: