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Coded aperture imaging photopolarimetry

An imaging polarimeter includes a polarization dispersing element, a spatial light modulator, a complementary polarization dispersing element, a polarization analyzer, an electronic detection plane, and a processor. The polarization dispersing element polarimetrically disperses an image of an object. The spatial light modulator spatially modulates the polarimetrically dispersed image. The complementary polarization dispersing element polarimetrically combines the spatially modulated and polarimetrically dispersed image. The polarization analyzer mixes orthogonal input polarizations with the polarization states of the polarimetrically combined spatially modulated image. The electronic detection plane measures the polarimetrically combined spatially modulated image that includes mixed polarization states. The processor calculates a polarization of the image from the measured polarimetrically combined spatially modulated image that includes mixed polarization states, an effect of the polarization dispersing element an effect of the spatial light modulator, an effect of the complementary polarization dispersing element, and an effect of the polarization analyzer.