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Microscopy method for the characterization of structural color on a single wing scale of Morpho butterfly[1] BEOM-JIN YOON, MATIJA CRNE, JUNG OK PARK, MOHAN SRINIVASARAO, School of Materials Science and Engineering, Georgia Institute of Technology — The structural color and the iridescence of Morpho rhetenor were investigated using an optical microscope and a digital camera. Incoherent white light source was used for both spatial and spectral analysis. The scattering pattern from the micrometer sized single scale in the back focal plane of the objective lens was observed with Bertrand lens equipped in the optical microscope. We precisely controlled incident angle of the light using common components typically embedded in most optical microscope; aligning aperture stop at the center or off-center. Wide range of the angular scattering pattern from a single scale was measured and the iridescence of Morpho rhetenor was measured quantitatively. The single scale of Morpho rhetenor diffusively reflected the normally illuminated light, while blue band was more effectively reflected than green and red band. We retrieved the raw intensity data generated at the imaging sensor of the digital camera and quantitatively analyzed the spatial distribution of the scattered light. The reflectivity measured by the digital camera was comparable to the result from microspectrometer reported earlier.

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