Feasibility of using Backscattered Mueller Matrix Images for Bioaerosol Detection CHANGHUI LI[1], GEORGE W. KATTAWAR[2], Texas A&M University — It has been shown that by looking at the backscattered radiance from an object illuminated by a laser beam one could effectively distinguish different morphologies from one another. However, if one wants to obtain all the information possible from elastic scattering either from a single particle or an ensemble of particles then one must use the Mueller matrix which contains all the polarization and radiance information available. In this talk, we will show that if we take advantage of the polarization information of the object, many more images related to the overall morphology as well as the internal structure of the object can be obtained. We will present images of the complete Mueller matrix to show the sensitivity of its sixteen components to both external and internal particle properties. We will also show that by using only one or two elements of this matrix one might be able to distinguish bioaerosols such as anthrax from more benign aerosols. We also show that the backscattering Mueller images contain more information than the forward scattering ones.

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