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**Optical Constants for  $Y_2O_3$  in the Extreme Ultraviolet** JOSEPH MUHLESTEIN, Brigham Young University, BYU EUV/THIN FILMS GROUP TEAM — In applications such as measuring ionized He in the Earth's magnetosphere, it is important to detect the relatively weak 30.4 nm line of  $He^2$  over the stronger 58.4 nm line of neutral He. Work done previously at BYU using theoretical optical constants has calculated that an aluminum/ $Y_2O_3$  multilayer mirror should be effective at maximizing reflectance at 30.4 nm while minimizing the 58.4 nm line. We have measured the index of refraction of  $Y_2O_3$  to improve the accuracy of these calculations and further our knowledge of  $Y_2O_3$  between the wavelengths of 5 nm and 30 nm. We created a sample mirror using electron beam evaporation and took measurements using the Advanced Light Source at the Lawrence Berkeley National Laboratory. As this is the first direct measurement of the index of  $Y_2O_3$  in this regime, it represents an improvement over previous data calculated using atomic scattering factors.

R. Steven Turley  
Brigham Young University

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