

WET LABS APPLICATION NOTE

SHAPE OF THE PARTICLE SIZE DISTRIBUTION FROM THE SLOPE OF THE BEAM ATTENUATION SPECTRUM AS DETERMINED BY AN ac-9.

The slope of the PSD, μ , can be derived from the slope of the beam attenuation spectrum, γ , as obtained from an ac-9. This was examined in detail by Boss et al. (2001). A link to this article is at the bottom of this page. These authors used Mie theory to model the dependence of the slope of the hyperbolic particle size distribution on the slope of the beam attenuation spectrum. They found the following approximate relationship:

$$\xi = \gamma + 3 - 0.5 * \exp(- 6 \gamma).$$

References:

Boss E., M. S. Twardowski and S. Herring, 2001. [The shape of the particulate beam attenuation spectrum and its relation to the size distribution of oceanic particles](#). Applied Optics, 40, 4885-4893.

Boss, E., W. S. Pegau, W. D. Gardner, J. R. V. Zaneveld, A. H. Barnard., M. S. Twardowski, G. C. Chang and T. D. Dickey, 2001. [The spectral particulate attenuation and particle size distribution in the bottom boundary layer of a continental shelf](#). Journal of Geophysical Research, 9509-9516.

Twardowski M., E. Boss, J. B. Macdonald, W. S. Pegau, A. H. Barnard, and J. R. V. Zaneveld, 2001. [A model for estimating bulk refractive index from the optical backscattering ratio and the implications for understanding particle composition in case I and case II waters](#). Journal of Geophysical Research, 106, 14,129-14,142.