

Extinction efficiency calculation of an infinite multilayered cylinder using transmission coefficients

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The purpose of this work is to develop a formalism for calculation of extinction efficiency, for infinite multilayer cylinder [1,2], based on the transmission coefficient.

We investigate particles with a large size parameter (the ratio between the particle size and wavelength) [3], and with high refractive index (optically non-soft particles, like metal-coated fibers).

The relationships are obtained by comparing the results of Mie calculations of the electromagnetic nearfield [4], with the classical theory of the electromagnetic field [5], and by using the fiber impedance parameter.

The mathematical expression obtained for the calculated transmission coefficient (and thus for the extinction efficiency) is quite complex, but it allows extraction of the extinction efficiency, which depends on the fiber parameters and its dielectric properties (ε and μ).

References

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