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Extracting broadband optical properties from uniform optical phantoms: an analysis of inverse-adding doubling method VINOIN DEVPAUL VINCELY, Miami University — In tissue optics, it is important to measure the amount of light that is being scattered and absorbed by tissues to describe, understand and exploit interactions of light with such turbid media. This is done by two well-developed techniques – fiber based diffuse reflectance spectroscopy (DRS) coupled to an inverse Monte Carlo (MC) model, and the inverse-adding doubling (IAD) technique coupled to measurements acquired using an integrating sphere (IS). The fiber-based DRS is easy to use experimentally and is well suited for in vivo use, but requires several calibration measurements along with good estimates about the spectral properties of tissue chromophores expected to be present in the signal. The IAD is an algorithm that computes the absorption and scattering coefficients using measured total diffuse reflectance and transmittance values of a sample. Here we analyze the accuracy of the IAD/IS system by obtaining measurements on a set of liquid phantoms prepared with controlled absorption and scattering properties which are obtained using Beer's law and Mie theory.

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