The Monte Carlo method is rapidly becoming the model of choice for simulating light transport in tissue. The process is as follow: The photon packet is initialized. The distance to the first interaction event is found and the photon packet is moved. If the photon has left the tissue, the possibility of internal reflection is checked. If the photon is internally reflected then the photon position is adjusted accordingly and the program continues, otherwise the photon escapes and the event is recorded. For photons which continue, some fraction of the photon packet will be absorbed each step. This fraction is recorded and the photon weight is adjusted. If the weight is above a minimum, then the test of the photon packet is scattered into a new direction and the process repeated. If the weight falls below a minimum, then roulette is played to either extinguish or continue propagating the photon. If the photon does not survive the roulette, a new photon packet is started [1].

The phantom we use for Monte Carlo simulation is a layer of bone in the air. The key parameters of the bone at wavelength 1064nm is as below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameters | Refractive index [2] | Scattering coefficient (1/cm) | Absorption coefficient (1/cm) [4] | Anisotropy factor [5] |
| Value | 1.55 | 165.2 | 0.15 | 0.93 |

The approximation of the wavelength dependence of the bone reduced scattering coefficient is given by the power law [3]. We know that where is the scattering anisotropy factor 0.93 [5]. We can therefore get the scattering coefficient of bone at the wavelength 1064nm is 165.2. And the thickness of the bone is in the range from 0.5 to 4mm with a 0.5mm step.

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