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The perturbation series solution of the time dependent radiative transfer equation

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Studies of light propagation in random media are of great importance in many areas of physics, such as, for example, astrophysics, biophotonics, particle physics, applied researches. Understanding and optimization of particles detector's response usually requires extensive simulations of photons transportation, often performed with Monte-Carlo techniques. Powerful Monte-Carlo
methods, efficient for detectors with nearly 4π coverage of the light source, drastically loose their efficiency for detectors sparsely distributed in media, such as Neutrino Telescopes. The need of CPU resources, required to achieve accurate results with a Monte-Carlo method in these cases, becomes very demanding. So we try to find an exact solution of transport equation. Existing solutions have big problems with calculations at high anisotropy parameters. The solution proposed in our work successfully copes with this problem and is an analytical-numerical scheme for calculating the light flux

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