Moments methods for radiotherapy

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This work is a follow-up to the paper [1], which introduced a moment approach for electron dose calculation and its application to radiation therapy. Our purpose here is to extend this work in several ways: first, a more detailed model for electron transport, which includes secondary electrons, is solved numerically. Second, the order of the minimum entropy moment closure has been increased, and we demonstrate that in 1D slab geometry we obtain a significantly better approximation. Third, we introduce a technique to lift a CFL-like stability restriction on the numerical method, and obtain much smaller computation times while not sacrificing accuracy. Several practically relevant test cases are shown.

Références

[1] R. Duclous and B. Dubroca and M. Frank, *A deterministic partial differential equation model for dose calculation in electron radiotherapy*, Phys. Med. Biol., 55, 2010.

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