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Radiative Molecular Dynamics: First concept

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Abstract content (Max 300 words) Formatting & Special chars

Radiative molecular dynamics is capable of modeling the details of N interacting radiating relativistic charged particles. As is well-known, molecular dynamics simulations have a computational load that scales as N^2 . We present a new concept, for which the computational load scales linearly with N . The linear scaling with N is achieved by subdividing the computational domain of each particle into near and far-field domains. In the near fields domain of each particle an $M(M-1)$ problem with $M \ll N$ is solved, where M is the number of particles in the near field domain of the particle under consideration. With the help of the BBGKY hierarchy of reduced probability functions it is explained under which conditions our radiative molecular dynamics model promises to be accurate.

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