

Multipole expansion for a spherical layer charge distribution

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 - *Date:* Fri, 30 Mar 2007 13:32:02 +0000 (UTC)
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Hi,

I have a random spherical distribution of N charges between radiuses R_1 and R_2 . N is up to 10^9 or more. I want to calculate the electrostatic potential closed to the origin of the sphere. R_1 and R_2 are much bigger than the distance of this point to the origin. So I thought about using the multipole expansion to calculate the potential, because it is supposed to reduce the Tcpu a lot, mainly because in this approach Tcpu proportional to N , and in explicit electrostatical potential calculation Tcpu proportional to N^2 . So, could you recommendme references in good books or papers or weblinks with examples of similar calculations ?

Thanks

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