Rotational tensors and their role in the construction of the multipole moments of a static charge distribution

anindya dey

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Abstract

We would begin by considering the reducibility of a Cartesian tensor and give abrief overview of spherical tensors and their transformation properties(spherical harmonics).The next phase would focus on the application of these properties to the construction of the "multipole fields"and treat the multipole moments of a static charge distribution as a specific example.We would consider the tensorial character of the successive multipole moments and demonstrate the multipole expansion of the energy of a charge distribution in an external electric field.

References

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[2] Angular Momentum in Quantum Mechanics: A.R.Edmonds(Princeton University ,NewJersey,1960)

[3] Classical Electrodynamics: by J.D.Jackson(John Wiley Sons)