Minisymposium 13 - Approximationsmethoden für Probleme auf der Sphäre

Threedimensional approximation of the total ponderomotive force on round uncharged objects in an electric field

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Droplets on outdoor high-voltage equipment suffer a total ponderomotive force which is non-vanishing in general. We consider a model problem of a round uncharged test-body. We show that the total force can be given as a series of inhomogeneity indicators of the undisturbed electric field. While the series is derived rather easily in 2d, it involves interesting aspects of the spherical harmonics in the use of 3d Fourier techniques. The found series expansion establishes a relation between the solutions of two Poisson equations on different domains. It is found that the expansion converges fast. The results are applied for droplets on realistically shaped insulators.