1046-35-1305　　　**Abhinandan Chowdhury*** (`axc3435@louisiana.edu`), 200 Oakcrest Drive, Apt No. E-254, Lafayette, LA 70503. *Perturbation of a Gradient Temperature Field due to the Presence of Two Spheres.* Preliminary report.

In micro-level studies of properties of multi-component media, the additions to the effective transport coefficient proportional to the first order of concentration connected with the solution of Laplace equation with linear gradient at infinity in infinite domain containing a sphere of different conductivity is known as "one-sphere solution". The second order in concentration effects for the overall transport coefficients can be estimated if the solution of the Laplace equation with linear gradient at infinity is found in an infinite domain containing two non-overlapping spheres with different transport coefficient. Our objective is to solve the two-sphere problem by using a rapidly converging spectral method. By using bi-spherical coordinates, the solution is expanded in series of Legendre polynomials and a numerical method is developed to solve the system for the coefficients. The specific difficulties connected with the spectral expansion are overcome and the solution is found for different configurations of the spheres regarding the linear gradient at infinity. This solution is valid for any arbitrary distance between the spheres. (Received September 15, 2008)