1078-41-190   **Quoc Thong Le Gia*** (`qlegia@unsw.edu.au`), School of Mathematics and Statistics, University of New South Wales, Sydney, NSW 2032, Australia, and **Kerstin Hesse**, Leipzig Graduate School of Management, Center for Advanced Studies in Management, Leipzig, Germany. *Numerical solutions to a boundary value problem on the sphere using radial basis functions.*

Boundary value problems on the unit sphere arise naturally in geophysics and oceanography when scientists model a physical quantity on large scales. In that situation, the curvature of the Earth cannot be ignored, and a boundary value problem has to be formulated on a subdomain of the unit sphere. For example, the study of planetary-scale oceanographic flows in which oceanic eddies interact with topography such as ridges and land masses or evolve in closed basin lead to the study of point vortices on the sphere with walls. Such vortex motions can be described as a Dirichlet problem on a subdomain of the sphere for the Laplace–Beltrami operator.

In this work, we construct approximate solutions to a boundary value problem on the unit sphere using radial basis functions via a collocation method. The error analysis between the exact solution and the approximation is provided. (Received December 06, 2011)