1065-65-135 **Murli M Gupta*** (mmg@gwu.edu), Department of Mathematics, The George Washington University, 2115 G Street (Monroe 221), Washington, DC 20052. *High accuracy solution of partial differential equations of fluid mechanics.*

We have recently proposed high accuracy compact finite difference schemes for a variety of differential equations, including the convection- diffusion equation. This work has been extended to the steady-state two-dimensional Navier- Stokes equations for which we have proposed a compact streamfunction- velocity (ψ-v) formulation. This formulation has been shown to avoid the difficulties associated with the traditional formulations (primitive variables, and streamfunction-vorticity formulations). In this presentation, we describe the ideas behind the development of compact formulations and present results for a variety of fluid flow problems. (Received September 10, 2010)