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Ning Ju* (ningju@math.okstate.edu), Department of Mathematics, Oklahoma State University, 401 Mathematical Sciences, Stillwater, OK 74078. *Two Dimensional Quasi-Geostrophic Equations.*

The two dimensional Quasi-Geostrophic Equation(QGE) and its dissipative version are special cases of the general quasi-geostrophic approximations for the atmosphere and ocean with small Rossby and Ekman numbers. They were also proposed by Professors Constantin and Majda, etc as low dimensional model equations for the mathematical study of the possibility of development of singularity from initially smooth solutions of either Euler or Navier-Stokes equations for incompressible fluids flows in three dimensional physical domains. Even though there has been important progress made in the recent years, many problems for the wellposedness theory remain open. In this talk, new results in this aspect on related issues will be presented and discussed. (Received February 05, 2006)