

1077-35-1904

**Chongsheng Cao\***, Dept. of Math., Florida International University, Miami, FL 33199, and  
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anisotropic Boussinesq equations.*

Boussinesq equations are mathematical models of buoyancy driven flows. In this talk we first introduce the 2D Boussinesq equations, then, we establish the global in time existence of classical solutions to the 2D anisotropic Boussinesq equations with vertical dissipation. (Received September 21, 2011)