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Xin Liu* (xliu@math.tamu.edu), Department of mathematics, Texas A&M university, College Station, TX 77843-3368, and **Edriss S. Titi**, Department of mathematics, Texas A&M university, College Station, TX 77843-3368. *On the existence and uniqueness of the 3D compressible primitive equations of atmospheric dynamics.*

The vertical scale in the atmosphere is relatively much smaller than the relevant horizontal scales. Capitalizing on this small aspect ratio, formal asymptotic analysis yields the compressible primitive equations for the atmospheric dynamics, which are obtained by replacing the vertical momentum equation in the compressible Navier-Stokes equations by the hydrostatic balance equation. In this talk, we report about recent advances concerning the well-posedness of the 3D compressible primitive equations, in particular, of how to overcome the difficulty caused by the absence of an evolutionary equation for the vertical momentum. (Received September 01, 2018)