**A model for turbulence in moderately stratified flows**[1] JENNIFER
JEFFERSON, CHRIS REHMANN, Iowa State University — Models based on the
Reynolds-averaged Navier-Stokes (RANS) equations have successfully predicted tur-
bulence in weakly stratified flows, but they require adjustment in more strongly strat-
ified flows to account for the interaction between turbulence and internal waves. In
contrast, rapid distortion theory (RDT), which strictly applies for infinite Richard-
son number, captures many features of the wave mode of strongly stratified flows.
To develop a model for turbulence in the moderate stratification observed in many
environmental flows, we incorporated aspects of RANS models into RDT and at-
tempted to predict the results of laboratory experiments of homogeneous turbulence
in a stratified flow. Using a turbulent viscosity and diffusivity computed from length
and velocity scales of the turbulence did not reproduce the timing of the oscillations
of the vertical density flux. The inadequacy of the turbulent viscosity approach
suggests including nonlinear interactions in the model by following the approach of
Kevlahan and Hunt (1997).

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Date submitted: 03 Aug 2012                    Electronic form version 1.4