CHOOSING THE AVERAGING OPERATOR FOR 3D MODELS

For quasi-static models

- Identify the fastest wave in the model - usually the Lamb wave.
- Select Δt you wish to use.
- Consider a linear shallow-water model with H equal to the equivalent depth of the fastest wave.
- Find eigenvalues and eigenfunctions of the local harmonic equation.
- Find the coefficients “a” for a truncated trapezoidal scheme..

For fully-compressible cloud-resolving models

- Consider a linear model for vertical propagating sound wave with the trapezoidal scheme.
- Derive the equivalent trapezoidal scheme with vertical averaging.
- Derive the corresponding truncated equivalent trapezoidal scheme.