The Model
Model based on the following momentum and mass-continuity equations in Cartesian coordinates:

\[
\frac{\partial \zeta}{\partial t} + \frac{\partial (\psi, \zeta)}{\partial (x,y)} = \nu \nabla^2 \zeta - \beta \frac{\partial \psi}{\partial y} \tag{1}
\]

\[
\zeta = \nabla^2 \psi \tag{2}
\]

Solution Technique:
- Equations solved using spectral methods
- Method allows for efficient calculation of the derivatives
- The streamfunction $\psi$ is used to derive the vorticity equation.

Model Specifications:
- 6400km x 6400km doubly periodic domain
- 512 x 512 grid points
- Ordinary diffusion with $e$-folding time of 1 hour for waves with a total wave number of 170

Objectives:
- Examine the effects of finite vorticity strip length and width on the evolution of an $f$-plane vorticity field.
- Investigate the effects of $\beta$ forcing on finite vorticity strips

Cases
Case 1: 1350km x 150km ($f$-plane)
Case 2: 2250km x 250km ($f$-plane)
Case 3: 3600km x 400km ($f$-plane)
Case 4: 2000km x 200km ($\beta$-plane)

References: