

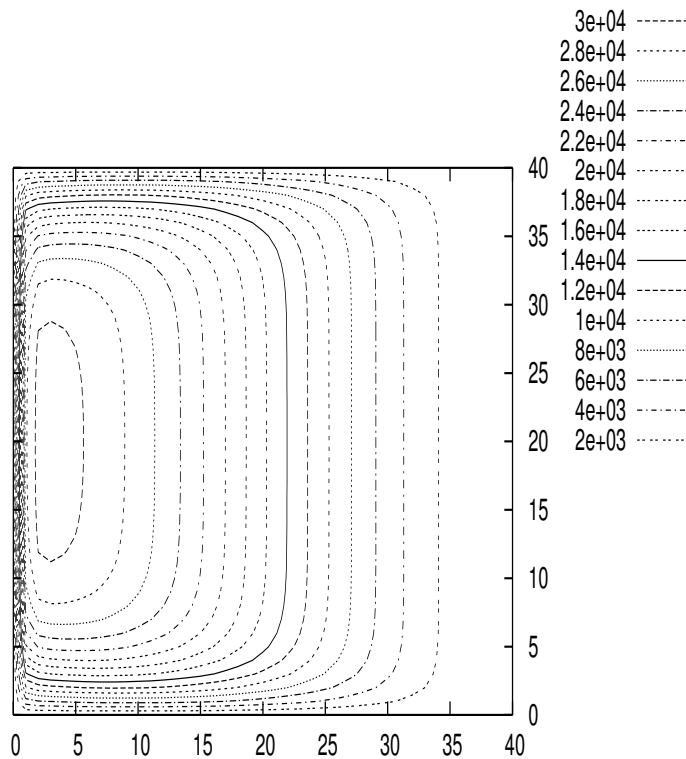
EOSC 579: Assignment #3:

Due Monday, April 14, 2025

1. On planet gork, the wind blows North-South instead of east-west! (In all other ways gork is just like earth). Given a wind-stress of

$$\vec{\tau} = (0, w_s \cos(\pi x/a)) \quad (1)$$

over a basin of dimensions $x \in [0, a]$ and $y \in [0, b]$, on a β -plane, an example of the solution to the Stommel Equation is:



Explain the dynamics of the four regions (interior, Northern, Southern and Western boundary layers). Using scaling analysis find the lengthscales of the 3 boundary layers.

The fortran code that found the numerical solution and a python version are available from the course website, if you wish to test your boundary layer thickness theories. (Compile the fortran code using gfortran on ocean machines)