

Numerical exploration of solid boundary conditions

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1 Introduction

Continents acts as solid boundaries in the world ocean, and this is the case almost everywhere except at the poles. The equator also acts as a solid boundary in both the ocean and atmosphere. It is therefore central to understand the effect of these boundaries on the dynamics. To study solid boundaries, we will solve the shallow water equations (SWEs) for an initial disturbance with a solid boundary numerically and analytically.

In Section 2 we present the SWEs and describe Kelvin wave solutions, while the numerical method and details are described in Section 3. A few central results are presented in Section 4 showing comparisons with theory and numerical scenarios. Attempts at explaining the results is done in Section 5, concluding the report.

2 Theory

3 Method

4 Results

5 Discussion