

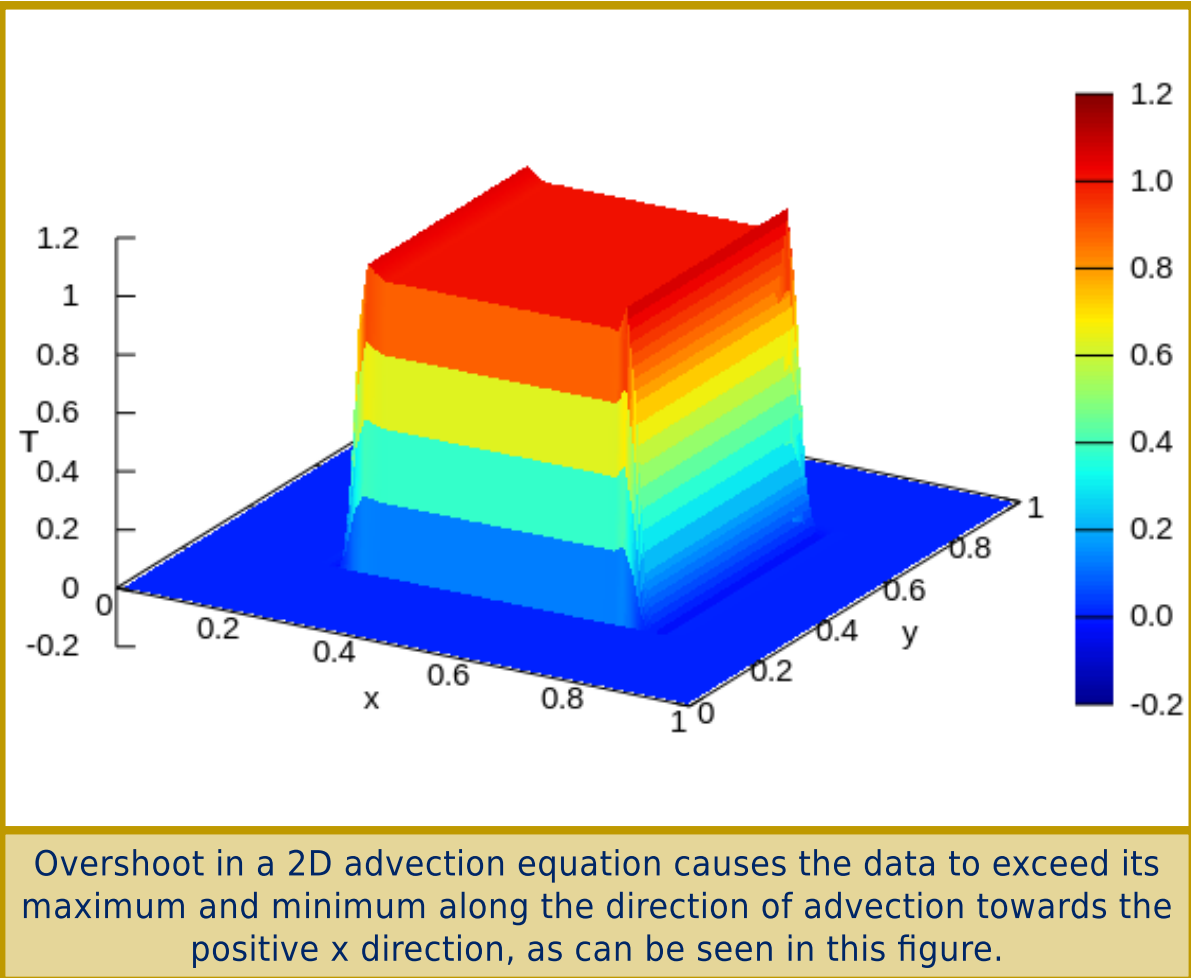
# The Overshoot Problem in Mantle Convection Models

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## Introduction and Background

The overshoot problem in computational modeling is an effect which may occur when attempting to model certain behaviors of a field with a sharp or discontinuous gradient.

The overshoot problem is characterized by oscillatory behavior along sharp gradients, causing the data to exceed its maximum and minimum values.



For the purposes of this report, we will consider the overshoot problem in the mantle convection simulation code ASPECT (**A**dvanced **S**olver for **P**roblems in **E**arth's **C**onvec**T**ion) as well as in a small test code written explicitly to experiment with the overshoot phenomenon. Both codes are available upon request.

## Overshoot in ASPECT