Isochrone distortion by topography and variations in accumulation rate in the case of constant flow mode

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Abstract

This is some exact solutions for the age equation, in the case of steady-state, constant flow mode (constant velocity profiles). We examine the effect of accumulation, ice thickness and divergence variations.

1 Introduction

2 The (P, θ) co-ordinate system

We consider a stationnary ice sheet with a homogene velocity profile. We suppose that the horizontal flow divergence is given by the flow tube width Y and we write the equation in the (x, z) co-ordinates. The ice sheet geometry is given by B the bedrock elevation, S the surface elevation, and $H = E - B$ the total ice thickness.

We defined $q(x, z)$ the 'partial horizontal' flux as:

$$q(x, z) = Y(x) \int_B^z u_x(x, z) dz. \tag{1}$$