

# Layer Thickness

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## Abstract

Total cortical, and relative layer thicknesses are analyzed.

## Introduction

Total thickness of cortical layers varies over the neocortex in the Mouse. Furthermore relative thickness of individual layers (i.e. layer thickness divided by thickness of all the layers together) also varies.

In this chapter we analyze how layer thicknesses, both total and relative, vary across regions, and validate the layer thickness of a reconstruction against experimental data.

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<sup>1</sup>This report was written using [DMT](#).

# Methods

Layer thickness can be very to not just measure, but even hard to define in the volume of a real brain.

## Measurements

- **Layer Thicknesses:** For each position in a sample, thicknesses of the layers were measured along an the local orientation of the cortical column.
- **Cortical Thickness:** Measured layer thicknesses were summed at each sampled position to provide total cortical thickness.
- **Relative Thickness:** Measured layer thicknesses at each sampled position were divided by the total cortical thickness at that position.

# Results

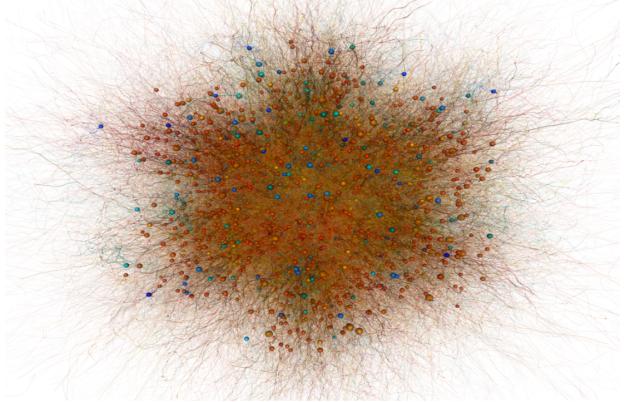
Results are presented in the figures.

## Cortical Thickness

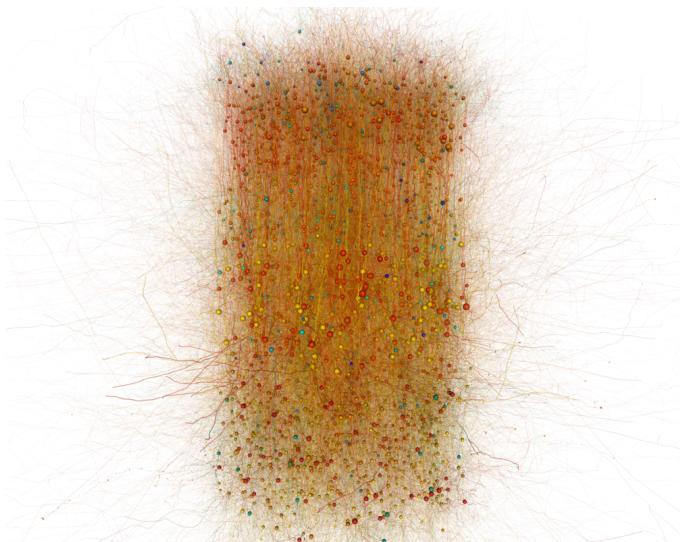
	mean	std
	1374.349498	0.0

## Relative Thickness

	mean	std
	0.087067	0.0
	0.069103	0.0
	0.130929	0.0
	0.134582	0.0
	0.261824	0.0
	0.316496	0.0



(a) Top



(b) Side

Figure 1: The neocortex is a 2-3 mm thick sheet of tissue on the surface of the brain. The figure above shows a digitally reconstructed neocortical column.

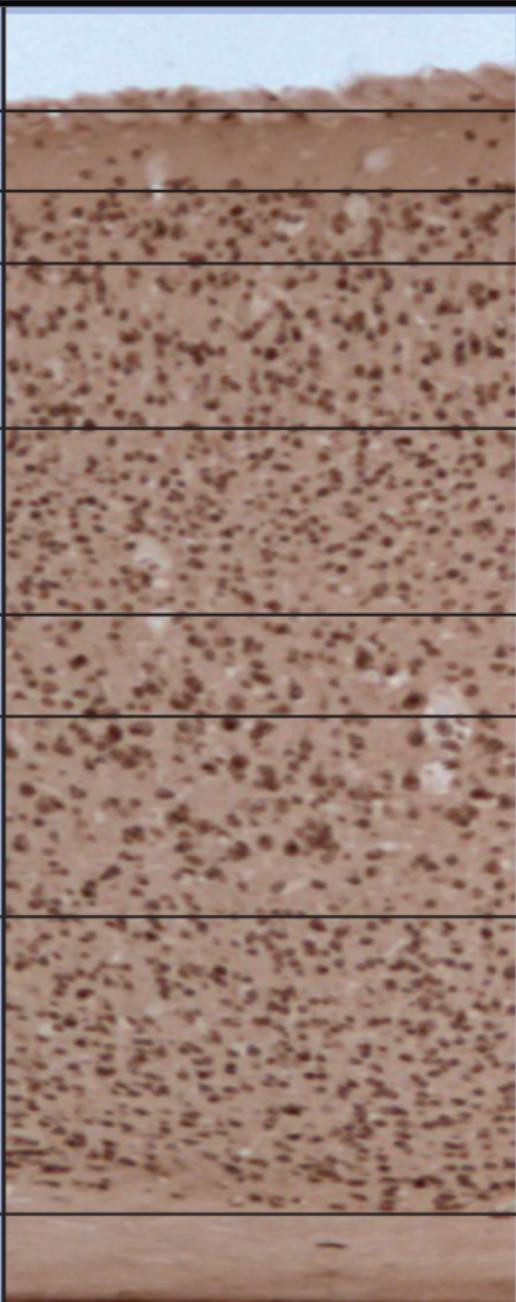
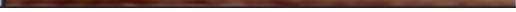
<b>Layers</b>	<b>mean (<math>\mu</math>m)</b>	
I	118,27	
II	93,01	
III	169,48	
IV	178,56	
Va	136,98	
Vb	212,19	
VI	420,46	
		

Figure 2: A slide showing experimentally observed layers in the mouse SSCx. The experimentalists marked 7 layers, splitting layer 5 into two. In the model, we have used the standard 6 cortical layers.

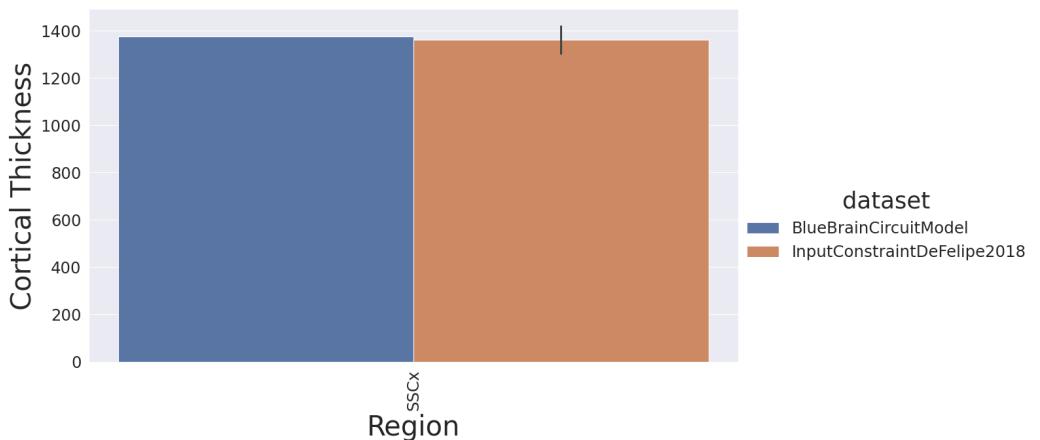


Figure 3: Total thickness of cortical tissue for the regions modeled, plotted along experimental measurements.

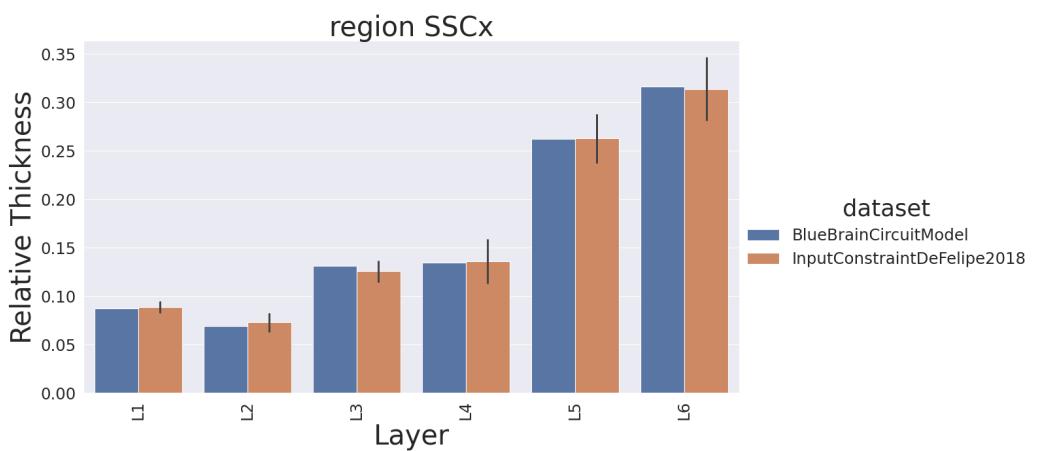


Figure 4: Thickness of cortical layers relative to total cortical thickness, plotted along experimental measurements.