

SUPPLEMENTARY INFORMATION FOR

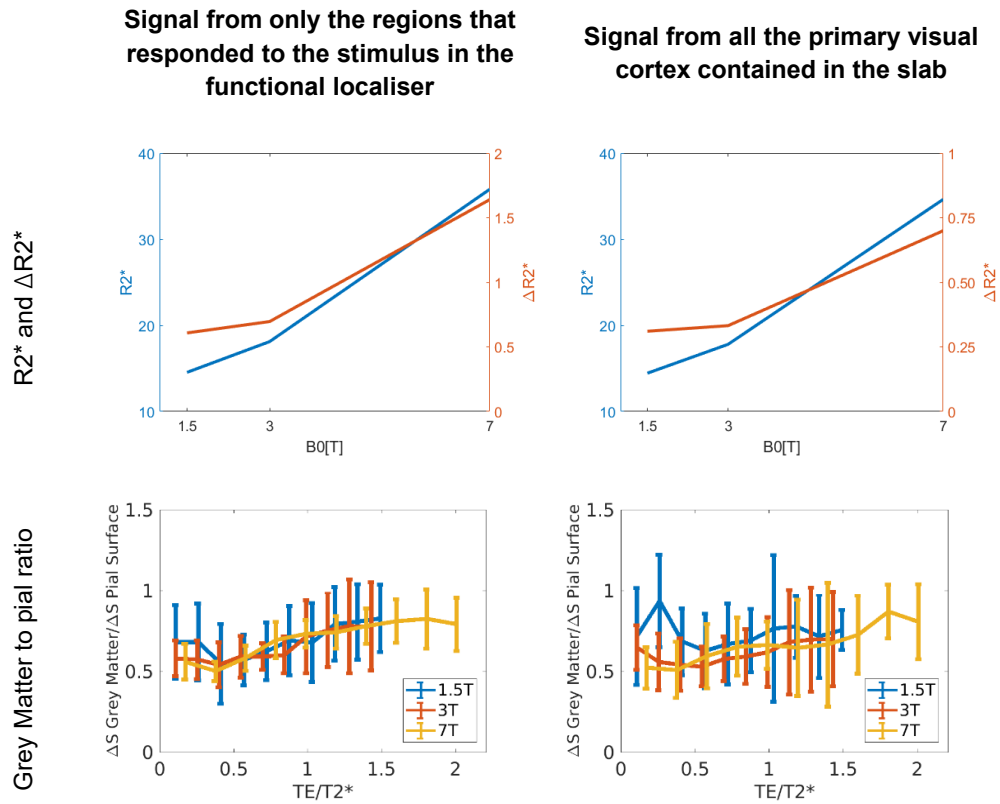
# **An in-vivo study of BOLD laminar responses as a function of echo time and static magnetic field strength**

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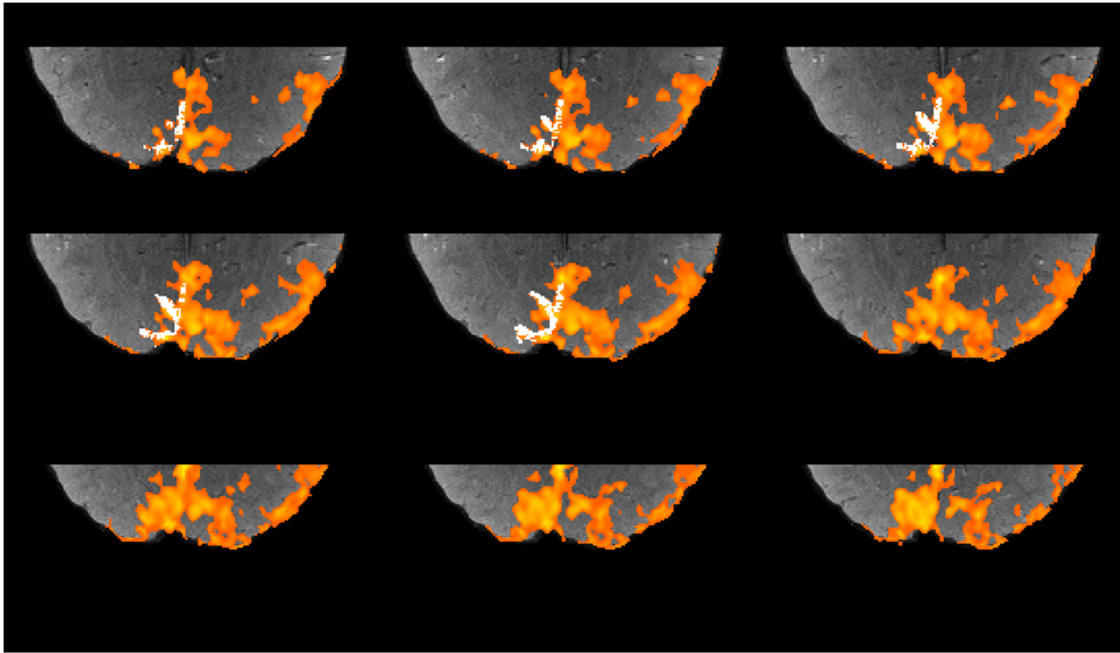
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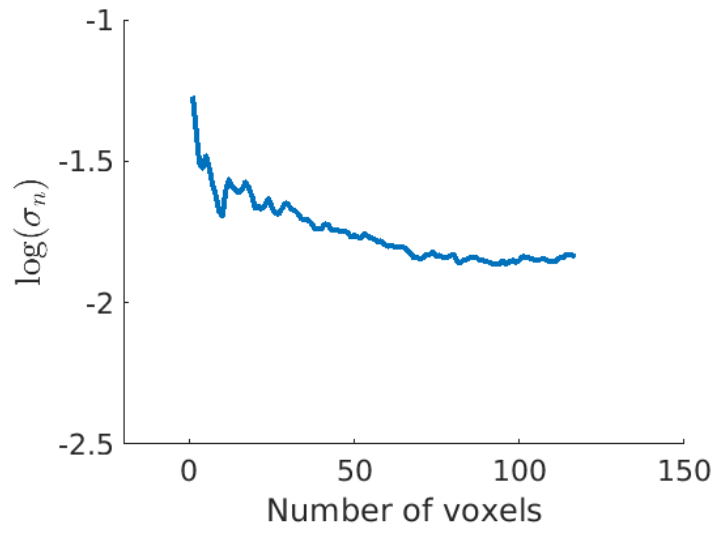
SI:FIGURES



**SI:Figure 1:** Relaxation time values and changes, upper row, and parenchyma to pial ratios, lower row, obtained considering the signal only from the activation mask, left, like in the body of the manuscript and considering signal from all of the primary visual cortex contained in the slab, right.



**SI:Figure 2:** The area in the occipital region that responded to the stimulus at 1.5T is shown in hot-body scale superimposed on the FLASH image (these are the same data as shown in the left column of Figure 1 in the manuscript). The white overlay shows 250 contiguous voxels chosen arbitrarily from the middle layer of the cortex. For visualisation purposes, also voxels within the grey matter located above and below the mid-cortical voxels are highlighted.



**SI:Figure 3:** Weisskoff test for 3D-EPI with 0.9mm isotropic voxel size and volume TR=3.96 s.

**SI:TABLES**

	<b>MPRAGE @ 1.5 T</b>	<b>MPRAGE @ 3 T</b>	<b>MP2RAGE @ 7 T</b>
TR	2300 ms	2300 ms	6000 ms
TI1/TI2	1100/-ms	1100/- ms	800 /2700 ms
TE	2.92 ms	3.15 ms	3.06 ms
FA1/FA2	8°/-	8°/-	4/5°
Voxel size	1x1x1 mm <sup>3</sup>	0.8x0.8x0.8 mm <sup>3</sup>	0.75x0.75x0.84 mm <sup>3</sup>
GRAPPA acceleration factor	3	2	3
Acquisition time	4 min 31 s	6 min 35 s	9 min 38 s

**SI:Table 1:** Relevant parameters of the whole brain anatomical scans at each of the field strengths.

Name	Abbreviation	Formula
BOLD signal change	$\Delta S$	$\Delta S = \overline{S_{act}} - \overline{S_{rest}}$
Functional contrast to noise ratio	(Functional) CNR	$CNR = (\overline{S_{act}} - \overline{S_{rest}}) / std(S_{rest})$
t-score	t	$S = X\beta + \varepsilon$ $t = \frac{c'\beta}{\sqrt{Var(\varepsilon)c'(XX')^{-1}c}}$

**SI:Table 2:** List of activation related metrics and their functions used in this manuscript.

Area and paper	Voxel size [mm <sup>3</sup> ]	1.5 T	3 T	4T	7 T
Occipital lobe <sup>1</sup>	1x1x3	74.9	59.7		42.1
Primary visual cortex <sup>2</sup>	1.25x1.25x5	69.4		31.7	
Visual cortex <sup>3</sup>	0.75x0.75x5			41.4+/-5.5	25.1+/-3.5
Average in cortical GM <sup>4*</sup>	2.1x2.1x3	84.0+/-0.8	66.0+/-1.4		33.2+/-1.3

**SI:Table 3a:** An overview of T2\*<sub>GM</sub> values (in ms) reported in the literature.

Paper	1.5 T	3 T	7 T
Y=0.6, Hct=0.43 <sup>5</sup>	40	14.28	4
Y = 0.62, Hct=0.44 <sup>6</sup>		21.2	
Y=0.72 <sup>7</sup>	42+/-2.8		
Y = 0.45 <sup>3</sup>			9

**SI:Table 3b:** Venous T2\* times, in ms) reported in the literature (ex-vivo samples). Y refers to the oxygenation of blood and *Hct* to hematocrit.

***Bibliography (Supplementary Information)***

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