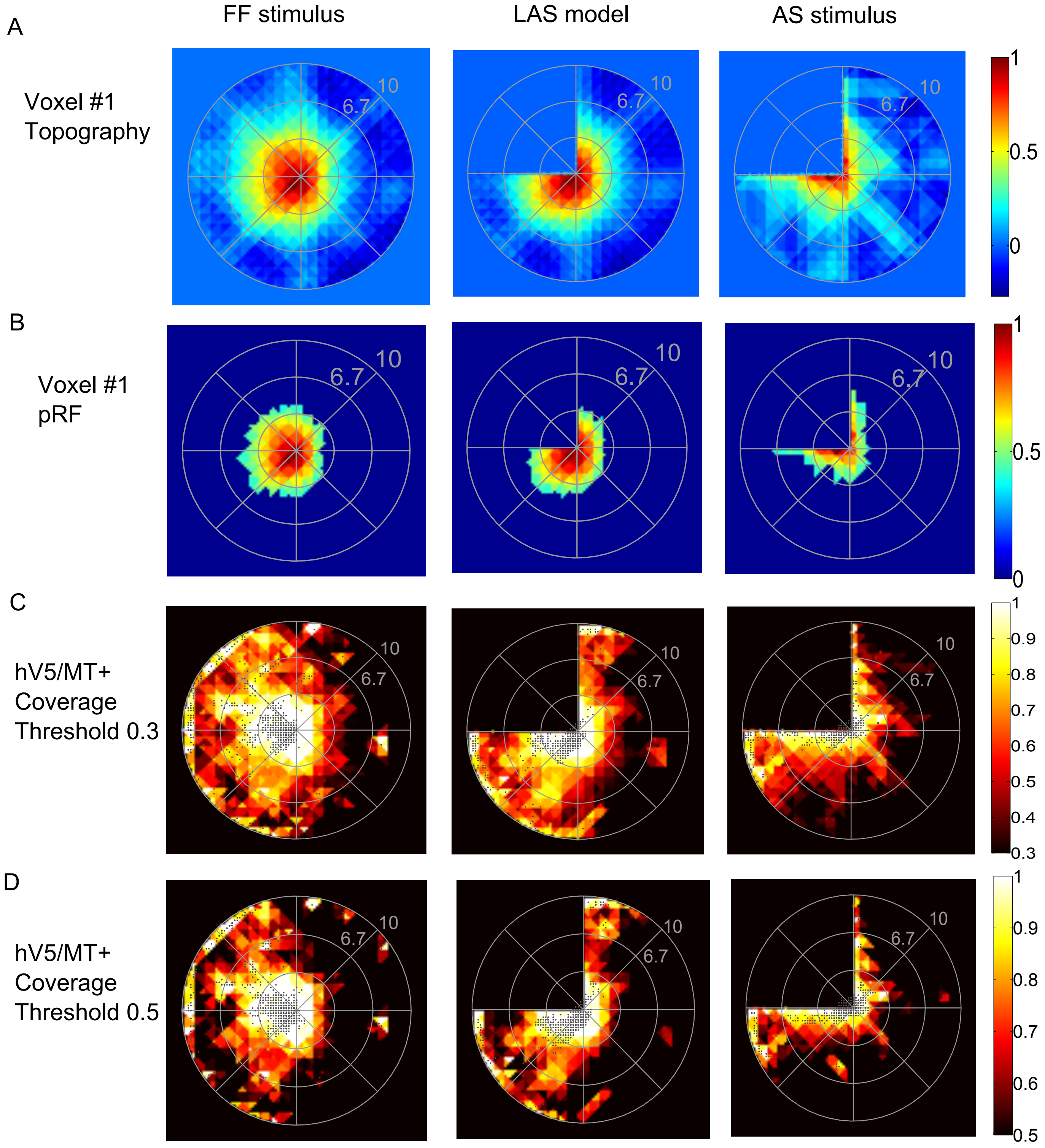

A
B
C
D
FF stimulus
LAS model
AS stimulus
Voxel #1
Topography
Voxel #1
pRF
hV5/MT+
Coverage
Threshold 0.3
hV5/MT+
Coverage
Threshold 0.5
10
6.7
1
0.5
0
0.9
0.8
0.7
0.6
0.4
0.3

Figure S1

(A) Left, pRF topography of one voxel in hV5/MT + under the full field stimulus condition (pRF_{FF}). The pRF covers locations both in the left upper and lower quadrants. Middle, pRF topography of the same voxel under the Linear-AS model (pRF_{LAS}, see methods). In brief, from the topography of the full field stimulus pRF_{FF}, the part of the pRF falling within the AS area is omitted by convolving the pRF_{FF} with the AS stimulus. The result of the convolution is then used to re-estimate the topography, deriving the pRF_{LAS}. In this case only of the part of the pRF which falls outside of the AS area is mapped. This gives us an estimate of the expected pRF topography under the AS condition, assuming linearity. Right, pRF topography of the same voxel under the AS condition (pRF_{AS}). The pRF_{AS} looks different than it would be expected based on the LAS model (pRF_{LAS}). The pRF_{AS} topography seems to have shifted towards the AS-border. (B) The pRF topographies of the same voxel presented in (A) under the different stimulation conditions after thresholding at 0.4 of the maximum value. By thresholding we derive only the central area of the pRF, useful for estimating the pRF center location and pRF size (see methods). (C-D) The visual field coverage maps of hV5/MT + from one control subject under the full field stimulus condition (left), under the LAS model (middle) and under the AS condition (right) when the threshold used to estimate the central pRF is 0.3 of the maximum (C) and 0.5 of the maximum (D). The main observations presented in the Fig. 2, hold across different thresholds.

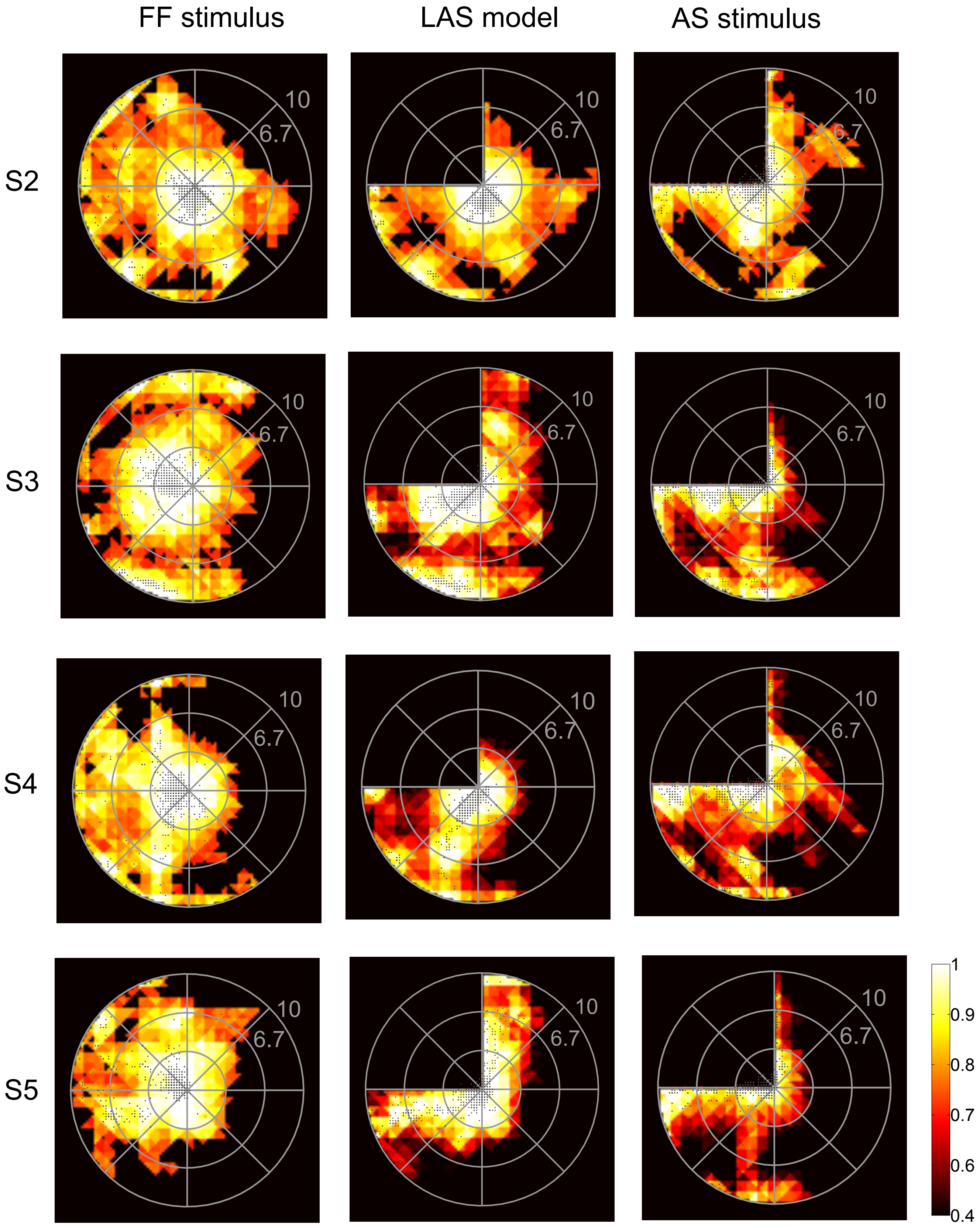
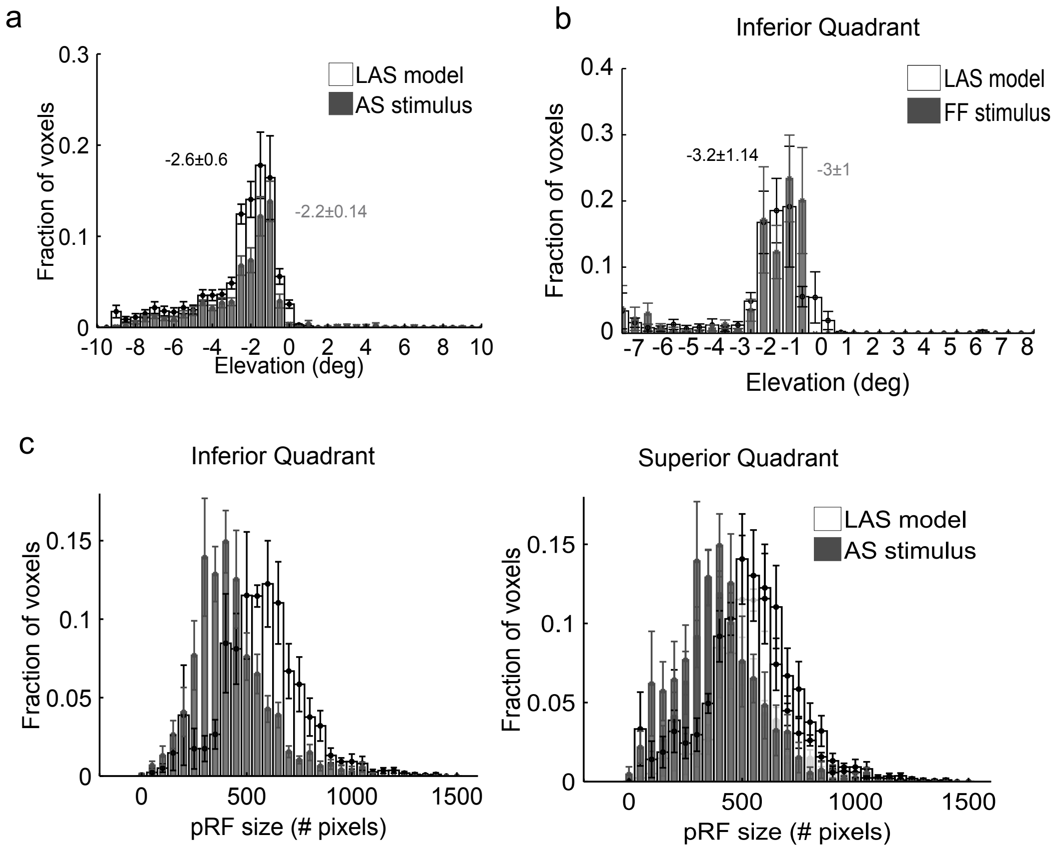

FF stimulus
LAS model
AS stimulus
S2
S3
S4
S5
10
6.7
1
0.9
0.8
0.7
0.6
0.4

Figure S2

Visual field coverage maps of subjects S2, S3, S4, S5. The visual field coverage maps of right hV5/MT + from the remaining four subjects under the full field stimulus condition (left), under the LAS model (middle) and under the AS condition (right).



a
Fraction of voxels
LAS model
AS stimulus
-2.6±0.6
-2.2±0.14
Elevation (deg)
b
Inferior Quadrant
Fraction of voxels
LAS model
FF stimulus
-3.2±1.14
-3±1
Elevation (deg)
c
Inferior Quadrant
Superior Quadrant
Fraction of voxels
LAS model
AS stimulus
pRF size (# pixels)

Figure S3

(a) Average distributions of the pRF center elevation from voxels in area V1 under the AS stimulus condition (gray bars) and under the LAS model (white bars) for all subjects. The mean and standard error of the mean of each distribution is indicated on top of the graphs with gray color for the AS stimulus and black color for the LAS model. There are no significant differences between the two distributions ($p = 10^{-17} > 10^{-57}$). (b) Average distributions of the pRF center elevation from voxels in hV5/MT + corresponding to the inferior quadrant under the full field stimulus condition (white bars) and under the LAS model (gray bars) for all subjects. There are no significant differences between the two distributions ($p = 10^{-19} > 10^{-32}$) suggesting that the LAS model is a good estimator of the residual pRFs expected under the AS condition. (c) Average distributions of the pRF size (surface area size of the pRF topography that showed activity above threshold) from voxels in hV5/MT + corresponding to the inferior (left) and superior (right) quadrants under the LAS model (white bars) and under the AS condition (gray bars) for all subjects. For all graphs, the error bars indicate the standard error of the mean across subjects (N = 5).

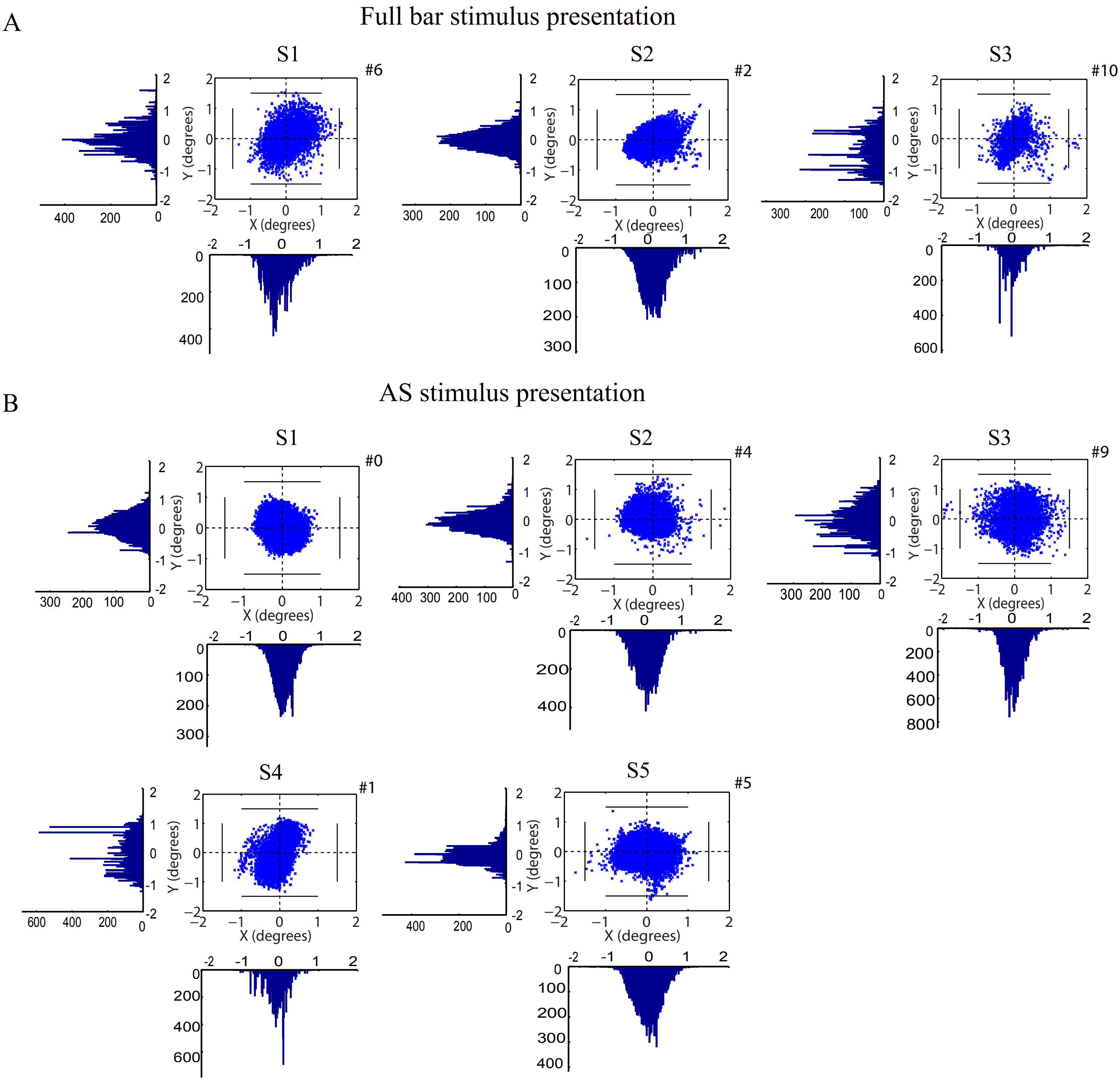
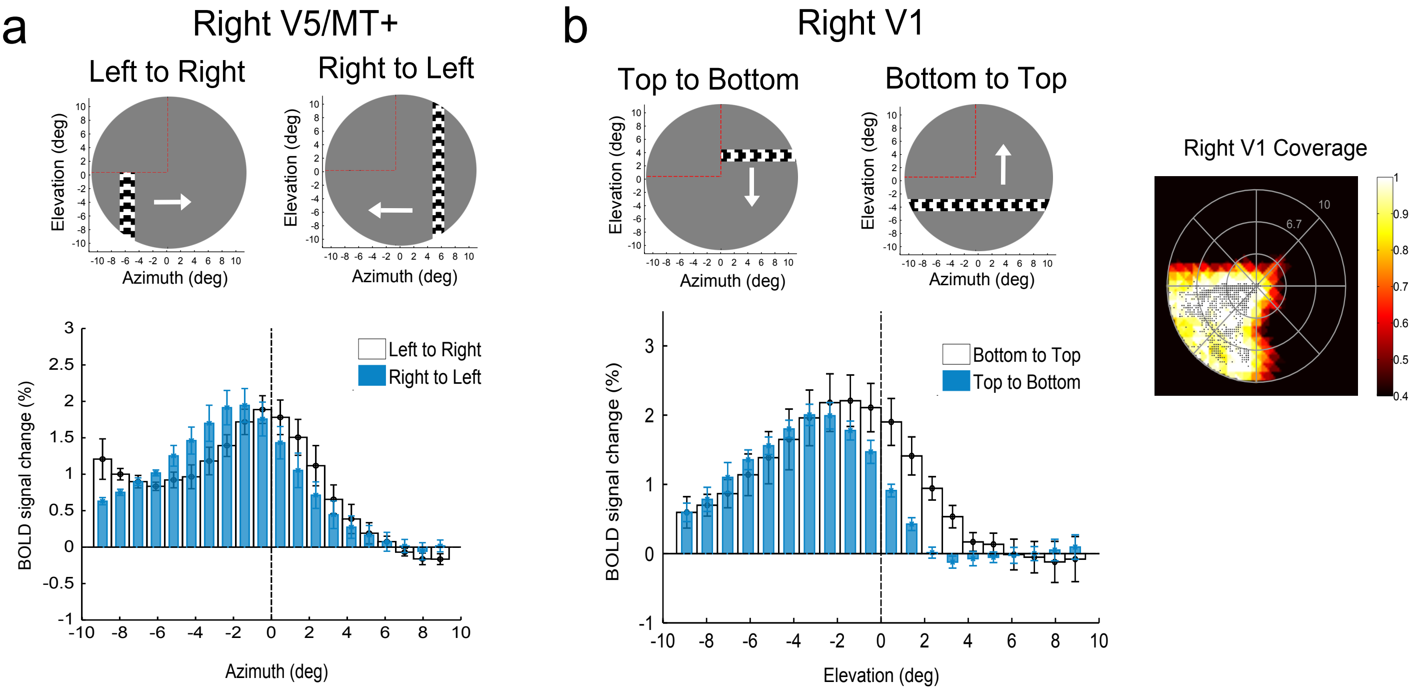

A
Full bar stimulus presentation
S1
#6
S2
#2
S3
#10
X (degrees)
Y (degrees)
B
AS stimulus presentation
S1
#0
S2
#4
S3
#9
S4
#1
S5
#5
X (degrees)
Y (degrees)

Figure S4

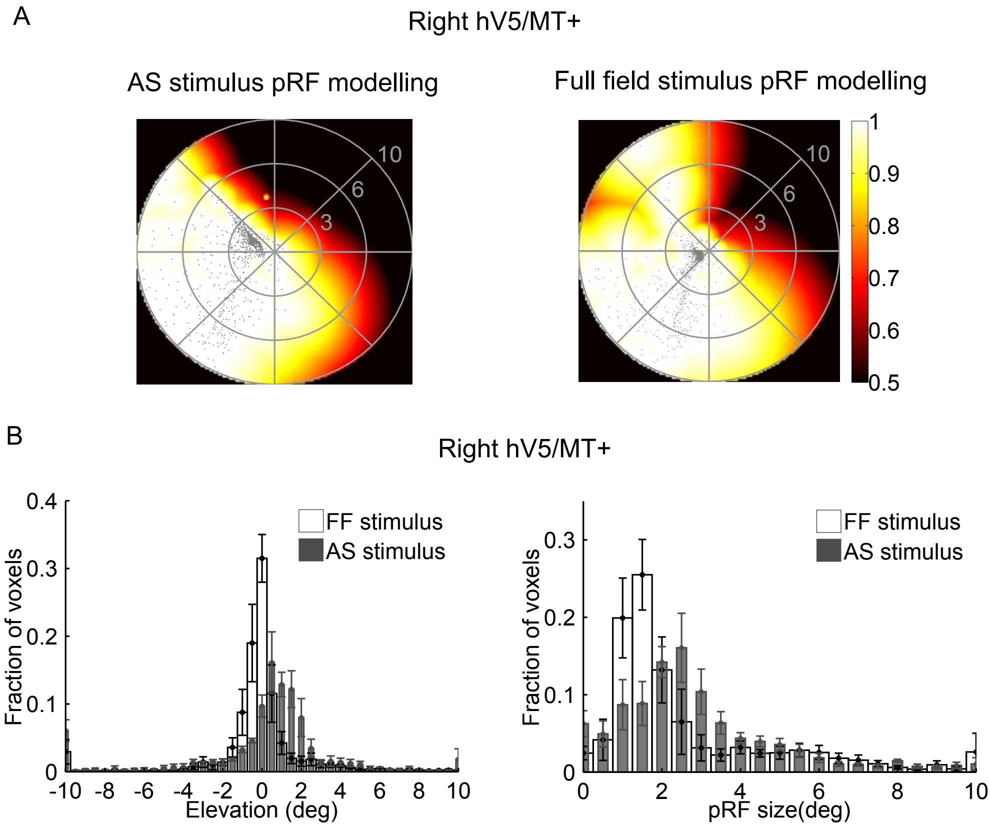
Eye movements for all subjects under the full field stimulus presentation (A) and under the AS stimulus presentation (B). Eye positions plotted at 60Hz for one whole session (6.4 min). The number of eye deviations, defined as excursions > 1.5° from the fixation point is indicated next to the graphs with the number sign (#).



a
Right V5/MT+
Left to Right
Right to Left
Elevation (deg)
Azimuth (deg)
BOLD signal change (%)
Left to Right
Right to Left
Azimuth (deg)
b
Right V1
Top to Bottom
Bottom to Top
Elevation (deg)
Azimuth (deg)
Right V1 Coverage
10
6.7
BOLD signal change (%)
Bottom to Top
Top to Bottom
Elevation (deg)

Figure S5

Average BOLD signal change under the AS condition. (a) The average BOLD signal change from all voxels in the right V5/MT + as a vertical bar is moving from the left (azimuth < 0; contralateral hemifield/AS) to the right of the visual field (azimuth > 0; ipsilateral hemifield) (white bars) compared to the average signal change as the vertical bar is moving from the left (ipsilateral) to the right (contralateral) of the visual field (blue bars). The error bars indicate the standard error of the mean across control subjects (N = 5). On top, a snapshot of the orientation of the bar and direction of motion (white arrow). (b) Left, the average BOLD signal change from all voxels in the right V1 as a horizontal bar is moving from the top (elevation > 0; AS) to the bottom of the visual field (elevation < 0; seeing quadrant) (blue bars) compared to the average signal change as the horizontal bar is moving from the bottom to the top of the visual field (white bars). Right, visual field coverage of the right area V1 in one subject under the AS condition assuming the full bar stimulus for modeling the pRFs.



A
Right hV5/MT+
AS stimulus pRF modelling
Full field stimulus pRF modelling
10
6
3
1
0.9
0.8
0.7
0.6
0.5
B
Right hV5/MT+
Fraction of voxels
Elevation (deg)
pRF size(deg)
FF stimulus
AS stimulus

Figure S6

(A) Visual field coverage maps of area hV5/MT + contralateral to the AS (right hemisphere) for a subject under AS condition using a direct-fit method (Dumoulin and Wandell, 2008). On the left, the AS stimulus is used in the pRF estimation while on the right, the full field stimulus is used. In both cases the actual stimulus presentation is done with the AS stimulus. The visual field coverage maps extend significantly within the area of the AS at the upper left quadrant of the visual field whether we use the truncated bar (AS-model) or the full bar stimulus model. (B) Average distributions of the pRF center elevation (left) and pRF size (right) for voxels in right hV5/MT + of 5 subjects under the AS condition (gray bars) and under full field stimulation (white bars). PRF estimates are obtained using a direct-fit method (Dumoulin and Wandell, 2008). PRF distributions obtained under the AS condition differ significantly from those obtained under the full field stimulus condition for both the pRF center elevation ($p = 10^{-214} < 10^{-157}$, Kolmogorov-Smirnov test) and pRF size ($p = 10^{-214} < 10^{-157}$)

Table S1

Kolmogorov-Smirnov significance tests between the pRF center distributions of each control subject (S1-S5) under the AS condition and under the LAS model prediction for each visual field quadrant. Right = right hemisphere, Left = left hemisphere, IQ = inferior quadrant, SQ = superior quadrant. Significance is reported as $p = a < b$, where b is the value selected to reject the NULL hypothesis. b is estimated by comparing the distribution of each subject with all the other subjects for the same condition (AS or LAS). The minimum p-value of these comparisons was then used to test for significance between the distribution of the AS condition and the LAS model for each subject.

Table S1: Kolmogorov-Smirnov significance tests between the pRF center distributions of each control subject (S1-S5) under the AS condition and under the LAS model prediction for each visual field quadrant. Right= right hemisphere, Left= left hemisphere, IQ= inferior quadrant, SQ= superior quadrant. Significance is reported as p= a < b, where b is the value selected to reject the NULL hypothesis. b is estimated by comparing the distribution of each subject with all the other subjects for the same condition (AS or LAS). The minimum p-value of these comparisons was then used to test for significance between the distribution of the AS condition and the LAS model for each subject.

	S1	**S2**	**S3**	**S4**	**S5**
Elevation					
Right IQ	$10^{-201} < 10^{-10}$	$0 < 10^{-13}$	$10^{-64} < 0.05$	$10^{-56} < 10^{-43}$	$10^{-22} < 10^{-3}$
Right SQ	$10^{-29} < 10^{-4}$	$10^{-3} < 0.3$	$10^{-30} < 10^{-14}$	$10^{-39} < 10^{-2}$	$10^{-27} < 10^{-20}$
Left IQ	$10^{-122} < 10^{-20}$	$10^{-318} < 10^{-38}$	$10^{-92} < 10^{-6}$	$10^{-101} < 10^{-22}$	$10^{-118} < 10^{-11}$
Left SQ	$10^{-10} < 10^{-6}$	$10^{-7} > 10^{-9}$	$10^{-2} > 10^{-3}$	$10^{-9} > 10^{-21}$	$10^{-3} > 10^{-4}$
Azimuth					
Left IQ	$10^{-45} < 10^{-15}$	$10^{-195} < 10^{-37}$	$10^{-86} < 10^{-64}$	$10^{-12} > 10^{-35}$	$10^{-53} > 10^{-56}$
Left SQ	$10^{-156} < 10^{-14}$	$10^{-5} < 10^{-3}$	$10^{-45} < 10^{-32}$	$10^{-12} > 10^{-32}$	$10^{-32} < 10^{-7}$