

Spatial organization of spontaneous activities in the human visual cortex

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Spontaneous fluctuations in fMRI BOLD signal have been shown to be temporally correlated across widely distributed brain regions. We investigated the spontaneous fluctuations within the human visual cortex at a fine scale. A standard EPI sequence was used to acquire functional data (3 mm isotropic voxels, TR = 1s). Subjects were scanned under a “rest” condition with eyes closed. They also participated in a separate session for retinotopic mapping. In visual areas V1, V2, and V3, we found that the strongest correlations in spontaneous activities occur between voxels with receptive fields at the same visual eccentricity, both within and between quadrants of visual fields; the spatial distribution of correlated activities are non-specific in other spatial directions. This eccentricity organization of the spontaneous activities is robust across subjects and may reflect a fundamental organizational principle of the visual system.

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