

Title: Resting-State EEG Signatures of Visual Exploration Styles

In a previous study (Zangrossi et al., under submission), we showed the existence of two stimulus-independent behavioural styles in visual exploration: Static Viewers (mainly characterized by longer fixation durations and higher similarity of step length with a power law distribution) and Dynamic Viewers (mainly characterized by shorter fixations and lower similarity of step length with a power law distribution). These styles appear to be stable over time and occur even in the absence of a stimulus (see also Andrews et al., 1999) thus they seem to reflect individual intrinsic dynamics. Aim: In the present study, we aimed at exploring the EEG correlates of these styles, and possible neural markers of intrinsic exploration behaviour. We selected as possible markers resting-state EEG frequency power, individual alpha frequency peak and long-range temporal correlations (LRTC). Methods: Using a high-density EEG system (Geodesic 256 channels) we recorded two resting state EEG sessions (eyes open and eyes closed, 10 minutes each) from a sample of 42 healthy adults (25 females, mean age 24). Results: We identified resting-state EEG power and individual alpha frequency peak as possible neural markers of intrinsic exploration behaviour. Moreover, the strength of LRTC in neural signals display a significant positive correlation with the strength of LRTC in eye-movements.

References:

Andrews, T. J., & Coppola, D. M. (1999). Idiosyncratic characteristics of saccadic eye movements when viewing different visual environments. *Vision research*, 39(17), 2947-2953

Zangrossi, A., Cona, G., Celli, M., Zorzi, M., & Corbetta, M. (Under Submission). When Style Matters: Visual exploration is low dimensional and predicted by intrinsic dynamics.
