**TITLE:** The Amplitude of Low Frequency Fluctuations in Slow-4 vs. Slow-5 Passbands in Auditory and Visual Hallucinators with Schizophrenia

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**KEYWORDS:** schizophrenia, hallucinations, fMRI, low frequency fluctuations

**INTRODUCTION:** Measured low frequency fluctuations in resting state BOLD fMRI signals are correlated with spontaneous neuronal activity and abnormal fluctuation patterns have previously been reported in patients with schizophrenia (SZ). While there is a growing literature on abnormal resting-state dynamics in SZ, relatively little is known about the pathophysiology underlying particular symptoms like hallucinations. Measuring the mean amplitude of low frequency fluctuations (ALFF) in chronic hallucinators across different frequency passbands can enhance our understanding of the functional and behavioral impact of these low-frequency oscillations.

**PURPOSE:** Based on previous findings from resting state fMRI analyses of different types of chronic hallucinators (visual vs. auditory), we identified seven ROIs that were heavily implicated in the literature: hippocampus, thalamus, superior temporal gyrus (STG), precuneus, lingual region, parahippocampal gyrus, and amygdala. We explored potential main effects of hallucination type and frequency passband (slow-5: 0.01-0.027 Hz; slow-4: 0.027-0.08Hz) on measured ALFF in these seven regions.

**METHODS:** We obtained 92 T2*-weighted scans from the FBIRN database (chronic auditory hallucinators, n=49; chronic visual hallucinators, n=43). All images were pre-processed using SPM8 and voxelwise analyses of ALFF were performed across slow-5 and slow-4 frequency ranges. Next, we extracted corresponding eigenvalues (beta values) for each subject. Repeated-measures MANCOVAs were performed on the beta values for each ROI in each passband (significance threshold: p=0.05).

**RESULTS:** We found main effects of passband in the amygdala, hippocampus, and parahippocampus. There were significant interactions between band and gender in the precuneus and thalamus. In the thalamus, there was also a significant interaction between band and group.

**CONCLUSION:** The observed main effects reveal the frequency-dependent nature of ALFF and the observed interactions provide reasons to explore the role of the thalamus and precuneus in future studies of the pathophysiology and symptomology of SZ. Results show a greater ALFF difference in slow-4 and slow-5 passbands in visual hallucinators in the thalamus, suggesting that the spontaneous neuronal activity in higher frequencies in the thalamus is implicated in visual hallucinations in SZ.