title: global signal regression attenuates spurious frequency specific EEG-BOLD correlations

Abstract: recording neurophysiological and hemodynamic measures simultaneously is a powerful method for assessing neurovascular coupling, and is commonly used to investigate the neurophysiological origins of BOLD. Recently, these types of recordings have been used to investigate the neurophysiological correlates of the global signal, a component of BOLD thought to represent both a mixture of both neural activity and physiological noise. However, to date no study has explicitly examined the effects of global signal regression on neurovascular coupling metrics during simultaneous EEG-BOLD experiments. To this end, we controlled for commonly observed EEG artifacts such as ballistocardiogram and head motion artifacts, and examined neurovascular coupling in the alpha (8-13Hz) and gamma (40-80Hz) bands pre/post GSR. We find that significant spurious EEG-BOLD correlations in both alpha and gamma band exist, but are attenuated by GSR. Correlating the ballistocardiogram artifact with BOLD revealed a