

fMRI BOLD signal is dependent on the field strength of the magnet, hardware, postprocessing and most importantly on pulse sequence parameters. In this investigation we have studied the effect of repetition time (TR) on the change in the activation patterns and signal characteristics in the primary motor cortex using single shot echoplanar imaging technique. Echo planar T2* weighted BOLD contrast imaging was performed on 5 healthy right handed volunteers. Ten axial-oblique slices were acquired to cover the primary motor cortex. Imaging parameters included: TR = 1-5 sec. TE = 54 ms, FOV = 220mm, Matrix Size=128x128, Slice thickness = 5mm, and bandwidth = 1470Hz/pixel. Each subject participated in five “rest” and “activation” conditions called as epochs at five different TR intervals. The activation task consisted of 2Hz single finger opposition. A paired t-test was conducted comparing all the rest and activation measurements. The results show that the mean Z-score for each TR was similar across all the subjects. The statistical differences were not significant ($F = 0.475$, $P = 0.75$), suggesting that the Z-scores did not vary as a function of TR. Hence we concluded that the use of TR in the range of 1-5 sec does not significantly alter the final BOLD signal in the primary motor cortex. However, use of reduced TR has a favorable impact on fMRI in reducing the imaging time resulting in reduced patient motion artifact, lower cost, as well as improved patient comfort during lengthy fMRI protocols.