



Fig. (S1). The effect of a bi-polar crushing gradient on the BOLD response to 16s, 1.2mA, 5Hz electrical stimulation of the whisker pad. An ~7% BOLD signal change is observed without diffusion weighting ($b=0 \text{ s/mm}^2$). With a high diffusion weighting ($b=333 \text{ s/mm}^2$) velocities of 1.82 mm/s are 'crushed'. This correspond to 'capillary like' velocity [50] and thus the majority of IV effects have been nulled. BOLD signal magnitude is reduced by 1/3 meaning at the current field strength (3T) the EV:IV ratio is 2:1. This agrees with the experimental work of Lu *et al.* [42] and the theoretical approach of Martindale *et al.* [48]. Standard errors are shown.