Supporting Information: Joint Design of Large-Tip-Angle Parallel RF Pulses and Blipped Gradient Trajectories

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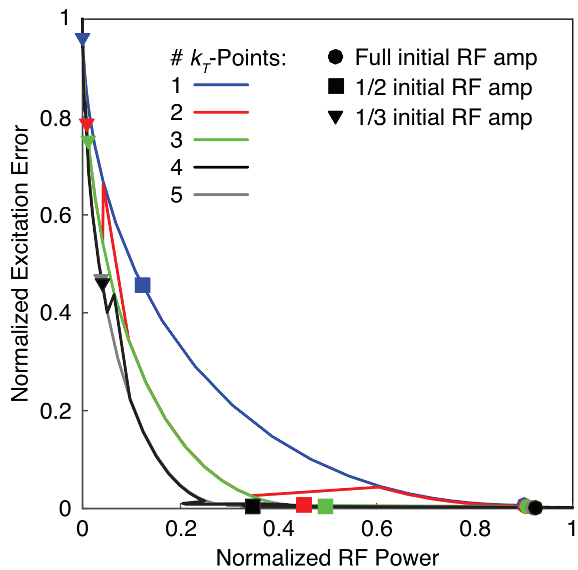

Figure S1: L-Curves for two-channel 1-5 k_T-point pulses, designed for 180° refocusing in one subject's axial brain slice. Each point in the curve corresponds to a pulse design with a different fixed integrated RF power regularization parameter λ (with periodic re-computation turned off in the LTA algorithm). As the number of k_T-points increases, the elbow in the curves becomes more pronounced, reflecting the opportunity for an increasingly favorable tradeoff between integrated RF power and excitation error. Also plotted are error-power coordinates returned by the algorithm *with* λ re-computation for each number of k_T-points and for different initial STA RF pulses. The initial RF pulses were obtained using the STA algorithm without integrated power regularization, and were either used as-is ('Full initial RF amp' case), or were scaled by 1/2 or 1/3. The positions of the final LTA coordinates for each of these initializers indicate that the LTA algorithm (with λ re-computation) tends to preserve the error-power balance of the initial RF pulses.

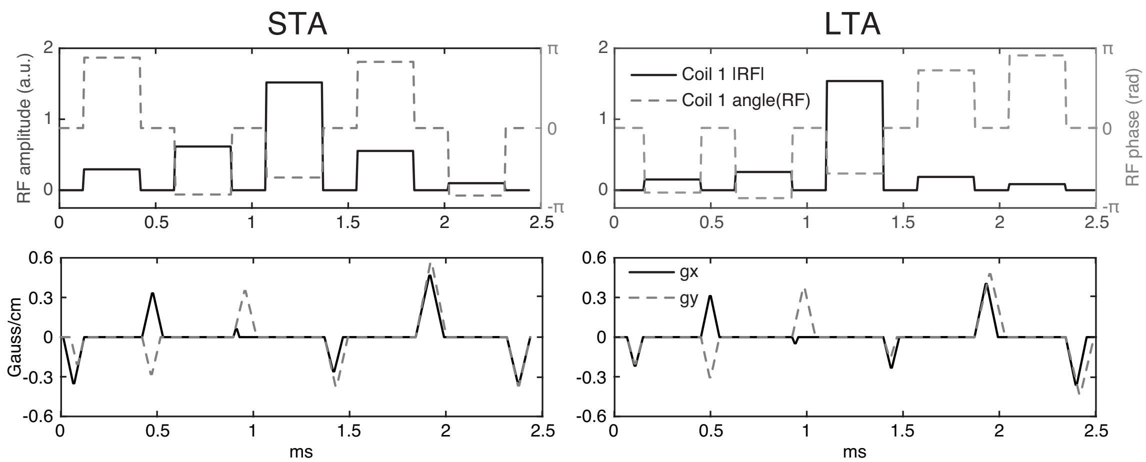

Figure S2: Comparison of STA and LTA k_T-points pulses for one transmit coil, from the in vivo experiment of Figure 5 of the main text. Overall, each subpulse of the LTA pulse has a different phase and amplitude compared to the initial STA pulse, and the gradient blips were also rescaled by the LTA design.