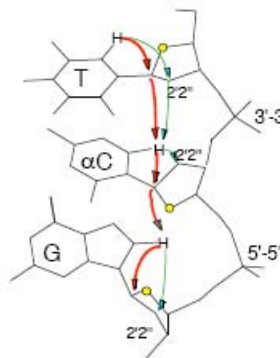
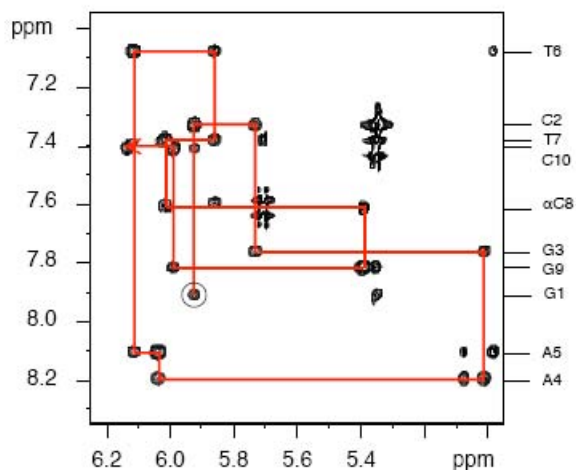


## BCMB/CHEM 8190 Answers, Problem Set 8

1) There are 9 Gs and 3 Us

2)



3) The magnitude is simply  $94 - 73 = 11$  Hz. The sign is positive. This is because one bond  $^1\text{H}-^{15}\text{N}$  couplings are negative because of the negative gamma for  $^{15}\text{N}$ . A decrease in splitting must come from a positive RDC (we assume all RDCs would be less than 94 Hz).

4) Scaling in solids NMR is by a factor of  $(1 - 3\cos^2\theta)/2$ . This factor is zero at  $54.7^\circ$ , but 0.12 at  $50^\circ$ . The line would be 24 ppm wide or  $24 \times 500 \times 0.25$  or 3000 Hz at 125 MHz for  $^{13}\text{C}$ .