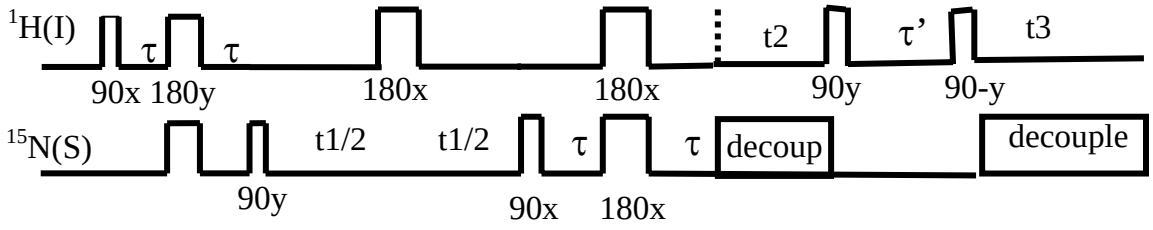
BCMB/CHEM 8190
PROBLEM SET 7

1) A NOESY experiment is conducted on a small protein using a short mixing time (50ms). Crosspeaks are observed and integrated for a glycine residue. Using the distance between the two alpha protons in this amino acid (0.175nm) as a distance standard, and the following crosspeak intensity data, estimate the dihedral angle phi (use other standard bond and angle geometries as necessary).

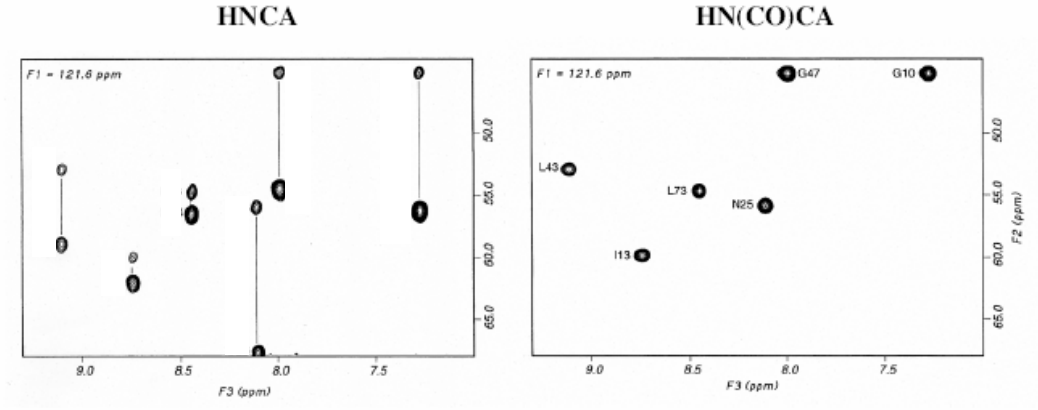
Ha1 - Ha2 28.0
Ha1 - HN 1.6
Ha2 - HN 0.5

2) The following is a heteronuclear NMR experiment to be collected on an ^{15}N labeled protein.



a) How many dimensions are there?
b) What nucleus is observed in each dimension?
c) What information is transferred in the mixing time τ'?
d) name the experiment.

3) The following are planes from HNCA and NHCO experiments taken at the same ^{15}N chemical shift.



a) add the residue number to the peaks in the HNCA spectrum
b) why are the upfield peaks in each pair weaker?
c) will the weaker peaks always be upfield?