

A Hands on Introduction to NMR

22.920

Lab and Problem Set #6

More Imaging and Velocity Encoding

1. Set up a slice selected 2D spin echo image with a hard 1 pulse and see that there is a strong axial signal in a 1-transient experiment. Why does a 4 scan sequence with Exorcycle phase shifting remove the axial signals?
2. Compare the contrast differences between a gradient echo and spin echo image. Why are they different?
3. For a 1-D flow observe the echo position in a z-gradient spin echo sequence versus the flow rate. Show how the shift in the echo position can be used to measure the flow velocity.