HSQC Experiment: What Happens When

- "Out and Back" Strategy:
  - Excite the Proton (^{1}H)
  - Transfer the Excitation to ^{13}C (One-Bond)
  - Measure ^{13}C Chemical Shift (t_1 Evolution)
  - Transfer the Excitation back to ^{1}H
  - Record the ^{1}H FID (Measure ^{1}H Shift)
- Transfer of Excitation Requires a J Coupling:
  - Wait 1/(2J) to Get Antiphase State:
    - One Component of ^{1}H Doublet is Upside-Down
    - For $^{1}J_{CH}$ = 150 Hz This is 3.33 ms
  - Simultaneous 90^{o} Pulses on ^{1}H and ^{13}C
  - Final 1/(2J) Delay to Get Back in Phase