

## 500 MHz Spectrometer Information

### **DBG probe:**

- This is the probe that is normally in the spectrometer
- Can be used for  $^{19}\text{F}$  and  $^6\text{Li}$
- Use corresponding  $^{13}\text{P}$  capstick and  $\frac{1}{4}$ -wavelength cable for  $^7\text{Li}$  (X channel)
- Can see Li-N coupling, but cannot decouple
- For Li, you need the 9.0B capstick in the left hole and the S capstick in the right hole (normally, the 9.0B capstick is in the right hole, so just move it over and put in the S)
- Can only go down to  $-80\text{ }^\circ\text{C}$
- The X channel (black and gold) and H channel (red,blue) are both tuned using two knobs: one matches and one centers (tunes) the peak.

### **LNC probe:**

- Great for  $^6\text{Li}$  and  $^{15}\text{N}$  (corresponding filter and  $\frac{1}{4}$ -wavelengths cables necessary (see below).
- Can do  $^6\text{Li}$  NMR using either the lock channel or the X channel (referred to as broadband or BB).
- If you need to decouple, use the lock channel and X for nitrogen. You will also need the 18G capstick in the probe.
- You get better sensitivity with BB, but you cannot decouple. You will need the 4.5G capstick.
- If using the lock channel, you tune using the silver tuning stick. Otherwise, use the red for X and blue for proton. Note that the top and bottom of the red and blue tuning sticks turn independently (one moves left/right, the other matches).
- This probe can reach  $-120\text{ }^\circ\text{C}$ .
- $^{13}\text{C}$  requires no capstick in the probe but needs a  $\frac{1}{4}$ -wavelength cable.

### **IDS probe:**

- Great for  $^{19}\text{F}$  (use this probe over DBG for  $T < 80\text{ }^\circ\text{C}$ )
- probably good for BB detection:  $^6\text{Li}$ ,  $^7\text{Li}$ ,  $^{13}\text{C}$  etc. (not yet tested though)
- No capstick, filter or  $\frac{1}{4}$ -wavelength required.
- $^{19}\text{F}$  is acquired through  $^1\text{H}$  channel: tune accordingly.
- $^1\text{H}$  tuning: red, blue knob.
- This probe can reach  $-120\text{ }^\circ\text{C}$ .

### **Filters and $\frac{1}{4}$ -wavelength cable:**

- Li filter says BE77 on the label
- N filter has 15N hand written on it
- $^{13}\text{C}$  filter is the small standard two-part filter
- Use the appropriate  $\frac{1}{4}$  wavelength (they have the frequency range written on them – Li is about  $^{73}\text{ MHz}$ ,  $^{15}\text{N}$  is about  $50\text{ MHz}$ ,  $^{13}\text{C}$  is about  $125\text{ MHz}$ )