AV-700

This high field instrument is specially equipped for high resolution solid state NMR studies though it can also perform solution state NMR studies with suitable probeheads and accessories. Currently this spectrometer has two MAS triple resonance solids probes that can receive 3.2 mm rotors and one twin X-channel MAS probe that can drive 2.5 mm rotors. This is the only solids capable spectrometer in the facility at present.

Console Hardware

- Bruker state-of-art AVANCE III console
- $^1$H base frequency of operation: 700.18 MHz
- $^2$H field frequency lock system
- Ultra shielded compact magnet from Bruker
- 40 RT shims
- BOSS 3 RT shim system
- VT range (with the included air chiller and dryer): −80 C to +120 C
- Three RF channels with latest generation SGU boards
- BLAH1000 amplifier driving $^1$H 1000 W peak pulsed output
- BLAX1000 amplifier driving X channel (up to $^{31}$P) with 1000 W peak pulsed output - RF range: 6 to 365 MHz
- BLAX500 amplifier for additional X channel with 500 W peak pulsed output - RF range: 6 to 365 MHz
- HPPR/2 preamplifier with 4 slices: $^1$H, X-BB(up to $^{19}$F - solutions only), X-BB(up to $^{31}$P) and $^2$H
- Integrated receiver+ADC board: DRU
- Max ADC sampling rate of 20 Ms/s
- Z-only gradient amplifier with max strength of 56 G/cm at 10 A nominal
- BCU-X compact automated chiller for VT operation (−80°C to +120°C)
- AD-XT extreme dryer to perform MAS operations down to −80°C
- Fully automated MAS controller capable of providing 24 kHz max spin rate with suitable rotor/probehead combination
- Pneumatic MAS inject/eject sample transport system

Software
- Topspin 3.6 - latest acquisition and processing software from Bruker
- ATMA - Automatic Tuning and Matching interface for compatible probeheads
- Topshim - Automatic 1D shimming and 3D gradient shimming, when strong ¹H signal is available
- EDTE - Variable Temperature control interface delivers a precision of at least ±0.1°C
- Runs on an industry standard Linux workstation with CentOS 5.6 platform

Probeheads
- ¹H(¹³C,¹⁵N) - MAS probe taking 3.2 mm rotors
- ¹H(¹³C,³¹P) - MAS probe taking 3.2 mm rotors
- ¹H-X-Y triple resonance MAS probehead accommodating 2.5 mm rotor delivering up to 24 kHz spin rate
- ¹H(¹³C,¹⁵N) solution state probehead with Z-gradient and ATMA accessory
- ¹H(X) solution state probehead with Z-gradient and ATMA accessory