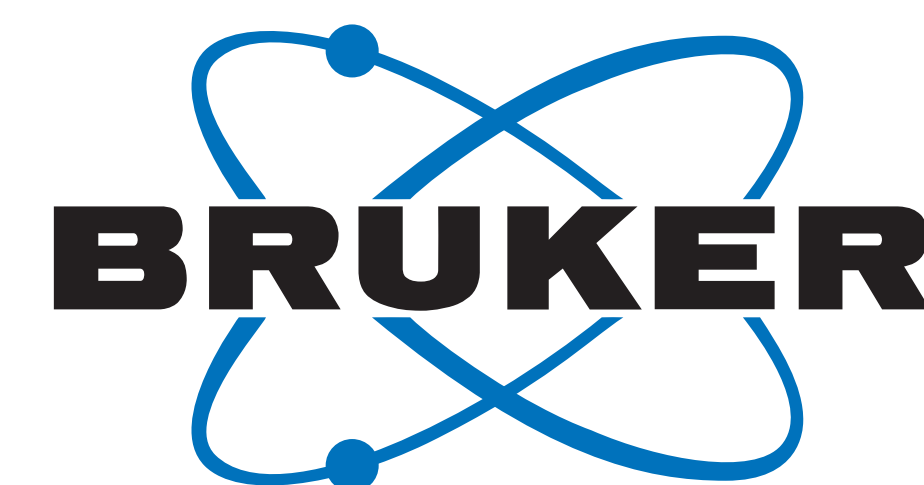


CPMAS and HRMAS iProbes Work in Progress



New generation of MAS-probes with full automation capabilities

Different flavors of automation in NMR

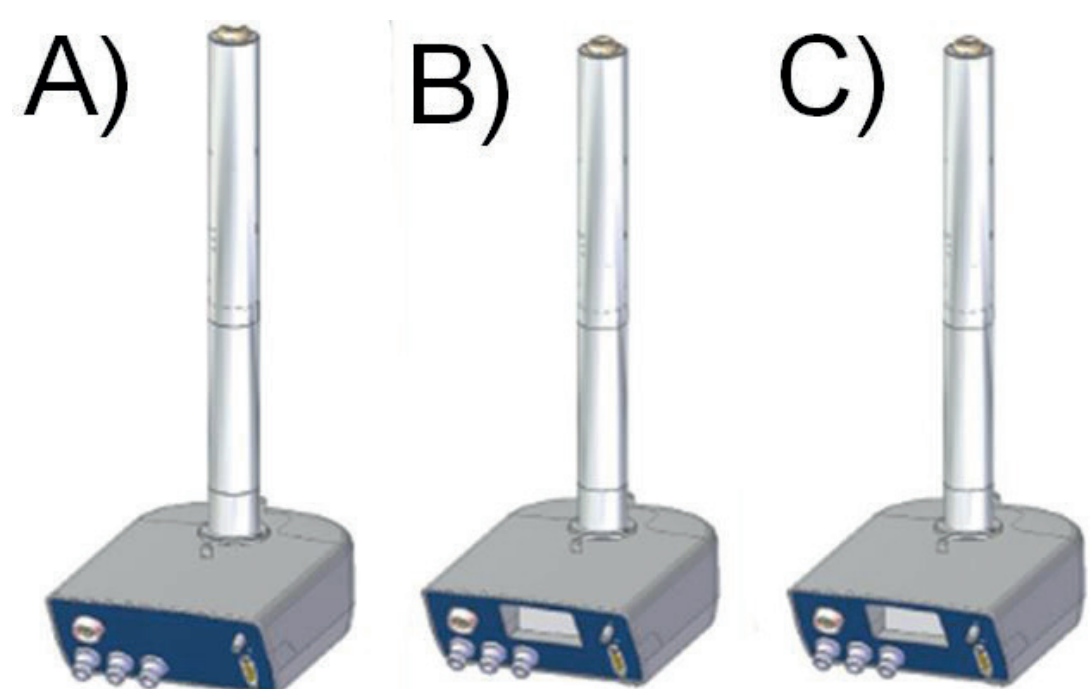
Depending on the laboratory's needs or goals, automation may have several meanings:

- High-throughput screening and overnight automation - several samples need to be measured with high sensitivity and without interruption;
 - Multi-user open and easy access, when the same instrument is shared among multiple users, with different level of NMR knowledge;
 - Higher reproducibility, due to less user interaction;
- For these and other reasons automation is an appealing tool not only for traditional solution-state NMR, but also for HRMAS and CPMAS. Metabolomics studies by HRMAS can be recorded under full automation more efficiently and reliably. Advance CPMAS solid-state experiments can be automatically optimized making them accessible to non-experts.

iProbes Overview

CPMAS and HRMAS iProbes are built on the new iProbe platform and they share the same innovations in terms of automation:

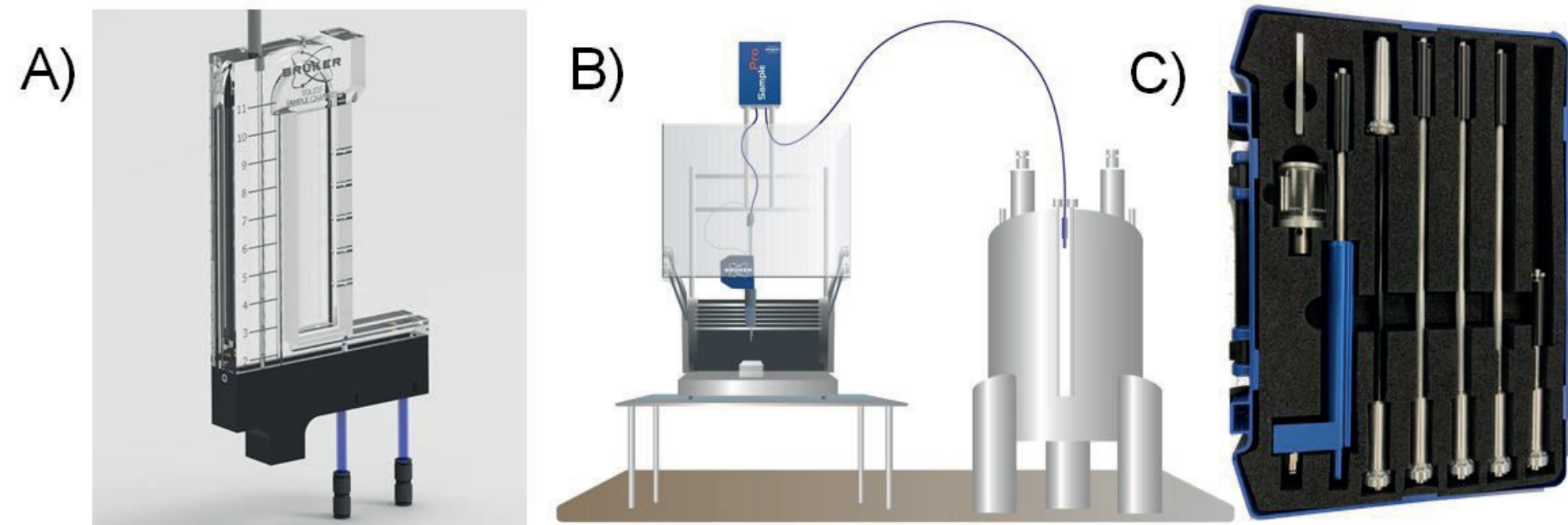
- Automatic sample insertion and ejection
 - Automatic tuning and matching
 - Automatic setting and adjustment of the magic angle
- These features assure more reproducibility, reliability and ease-of-use to the users.



The iProbe family: A) high resolution NMR probe, B) HRMAS probe and C) CPMAS probe.

Automated sample exchange

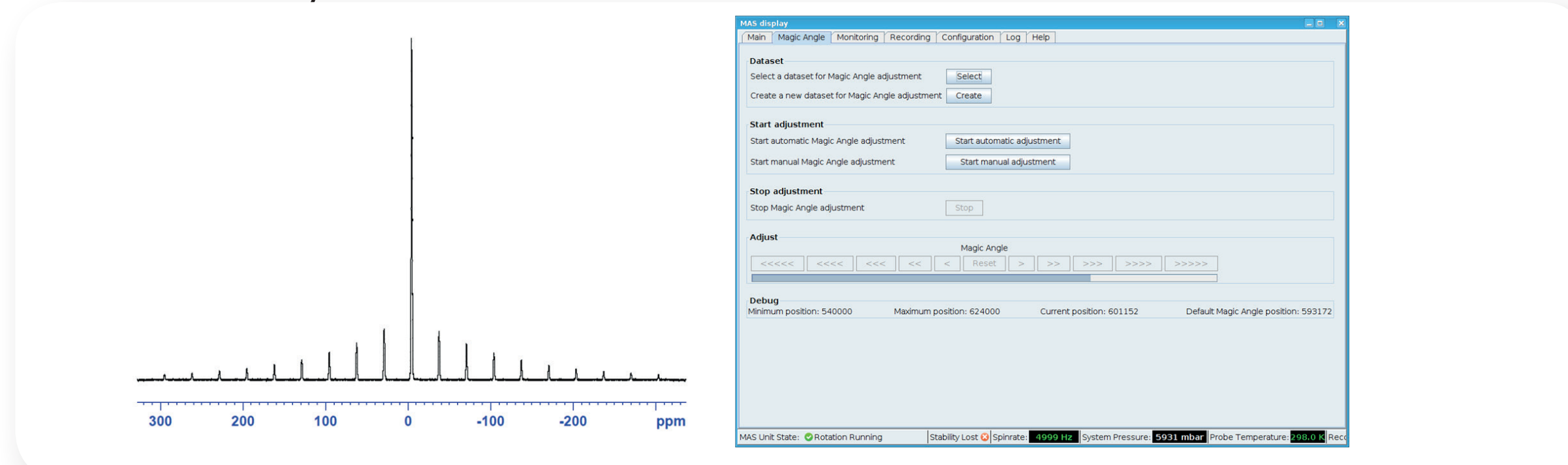
The sample exchange is also fully automatic thanks to the Bruker sample changers for 4 mm rotors. The MAS Sample can load up to 20 rotors consecutively. If advanced automation is required, SamplePro hr-MAS is able to select and transport rotors in a random order from a 48-holder plate. In addition, the plate can be cooled down to -16 C assuring the best storing conditions for delicate samples as tissues. Alternatively, the user can change the samples manually with a re-designed transfer tube which consent a quick switch from automatic- to manual-mode.



Bruker sample changers for MAS rotors: A) MAS Sample Changer and B) SamplePro HRMAS. C) The new transfer tube for iProbe.

Automatic Magic Angle Settings

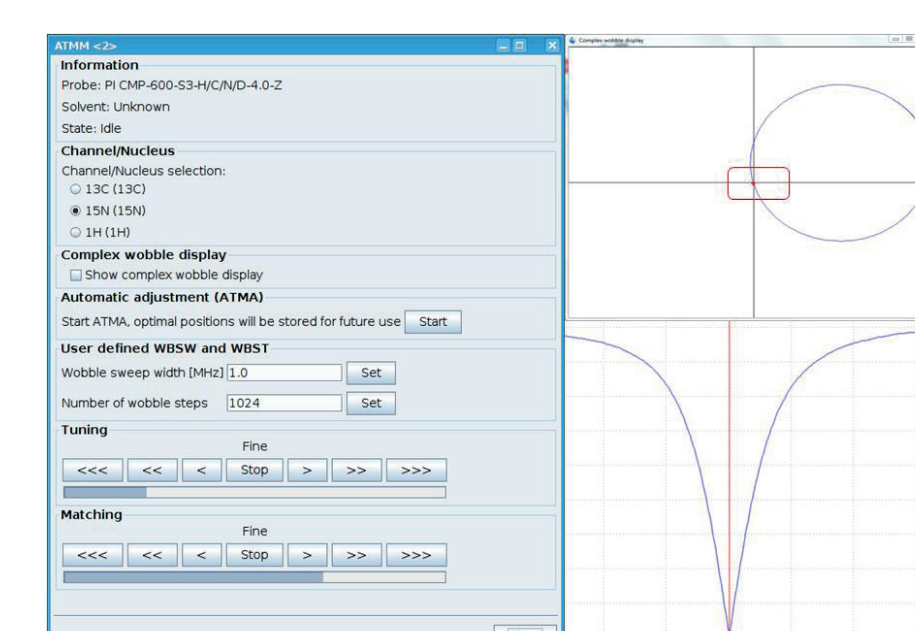
A dedicated motor is controlling the movement of the stator axis, and assures a smooth sample exchange. The magic angle is determined in full automation with a KBr sample, and stored for the future experiments. Furthermore, the quality of the settings can be automatically determined by TopSolids and stored for reporting. After a rotor exchange, the motor is re-setting the angle automatically.



KBr spectrum used for Magic Angle adjustment and the new Magic Angle tab on the MAS3 display.

Complex Tuning and Matching

Automatic tuning and matching with the CPMAS and HRMAS iProbes makes use of the novel algorithms introduced with the Avance NEO. Tuning and matching is now performed using complex data.



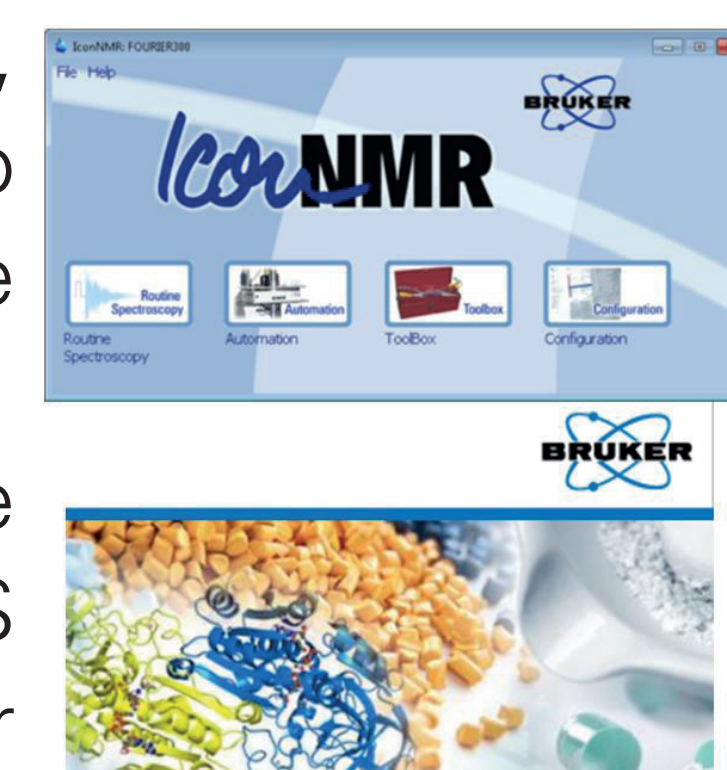
Tuning and Matching

- More reliable
- Nucleus-specific starting positions
- Self-optimization
- Functionality similar to Network Analyzer
- Offers support for applications such as spin noise tuning, over-coupling, determination of quality factor

Software for full automation routines

With our software tools, the full workflow, from system verification and probe setup, to experiment optimization and sample measurement, is automated.

TopSolids™ guides the user towards the probe setup and experiment optimization for CPMAS applications. While HRMAS users will prefer IconNMR to select and setup experiments from a large catalogue of Bruker' parameter sets. Creation of user specific experiments is possible in both environments.



Automation with uncompromised performance

Using automation does not sacrifice any performance: both the CPMAS and HRMAS probes deliver spectra of the equal but mostly better quality than the previous generation of probes.

Summary

- Automatic rotor exchange with dedicated sample changers
- Automatic tuning and matching with complex algorithm
- Automated Magic Angle Setting
- Uncompromised performances
- 400-600 MHz standard bore magnets
- iProbe HRMAS RF configurations: HCND, HCD
- iProbe CPMAS RF configurations: HX

