



ELEXSYS E780

- World's First Commercial mm-wave 263 GHz EPR Spectrometer

Bruker BioSpin has pioneered the world's first commercial mm-wave 263 GHz EPR spectrometer, ELEXSYS E780, representing a first step for Bruker's EPR division into quasi-optical microwave technology. It incorporates a unique superconducting magnet that can be ramped up to 12 T and is combined with new probe technology for optimum sensitivity, even on large samples up to 5 mm. Based on the well-proven Bruker ELEXSYS concept it provides multiple turn-key operation modes including, CW-, Pulse-EPR, ENDOR and ELDOR, thus enabling research groups for the first time, to routinely use very high frequency EPR technology.

Features

- Enables mm-wave very-high field EPR at 263 GHz
- Quasi optical front-end featuring reflection and induction detection
- Superconducting EPR magnet incorporating 12 T main coil and 0.2 T sweep coil
- Multiple turn-key operation modes including CW-, Pulse-EPR, ENDOR and ELDOR
- High sensitivity single mode resonator
- Non-resonant probe for samples up to 5 mm
- Variable sample temperature from 4 to 300 K
- Safe and robust operation
- Runs routine software package Xepr



Quasi optical front-end of ELEXSYS E780

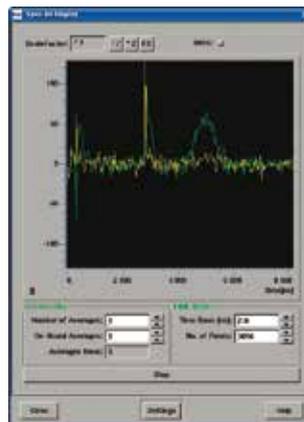
Very-High Field EPR Magnets

The ELEXSYS E780 is based on a unique superconducting magnet with specifications that match the needs of very-high field EPR applications.

- Vertical field
- 89 mm bore
- Main field 0–12 T in < 100 min (21 bit)
- Homogeneity 10 ppm in 10 mm dsv
- High resolution sweep coil (19 bit)
- High resolution range 0.2 T

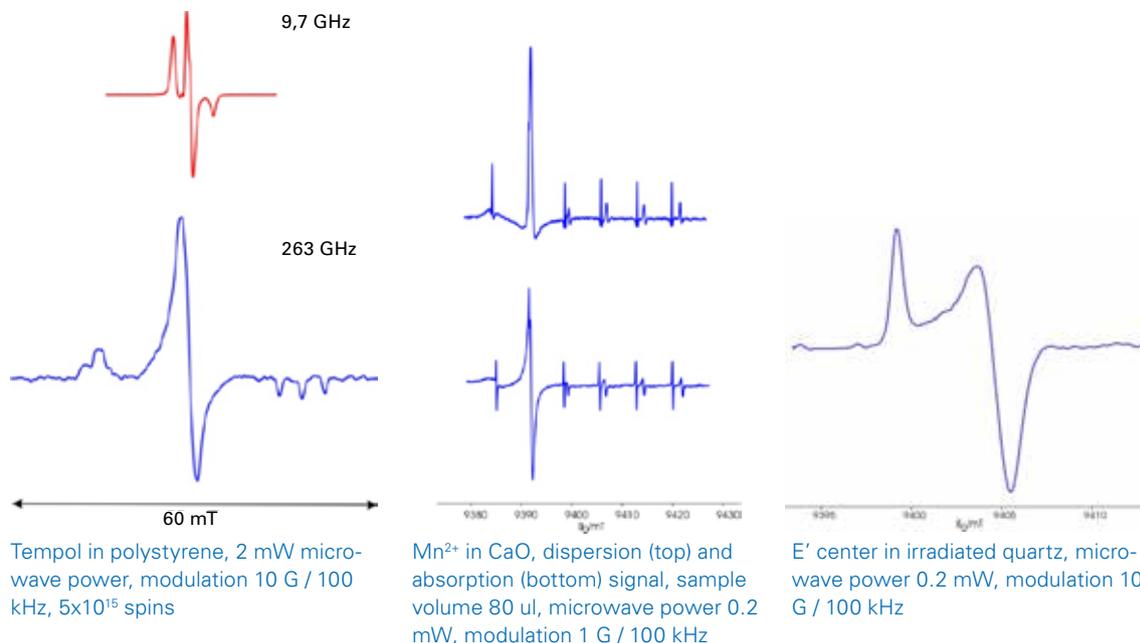
A Complete System

The ELEXSYS E780 is equipped with a quasi-optical front-end, featuring reflection and induction detection with safe and robust operation. The front-end is interfaced with a single mode resonator for highest sensitivity, and with a non-resonant probe featuring a larger diameter for samples up to 5 mm, both of which allow low temperature measurements down to 4 Kelvin. As with all other ELEXSYS systems, the E780 is driven by the proprietary Intermediate Frequency (IF) concept for optimum phase stability and pulse precision, and runs the Bruker software package Xepr, for routine and assisted expert workflows.



Spin echo of the E' center in quartz:
 - Single shot
 - Non-resonant probe
 - Pulse sequence:
 0.7-2-0.7 us

The first CW-EPR results were obtained in induction mode with a non-resonant probe at room temperature.



Tempol in polystyrene, 2 mW microwave power, modulation 10 G / 100 kHz, 5×10^{15} spins

Mn²⁺ in CaO, dispersion (top) and absorption (bottom) signal, sample volume 80 ul, microwave power 0.2 mW, modulation 1 G / 100 kHz

E' center in irradiated quartz, microwave power 0.2 mW, modulation 10 G / 100 kHz



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