

Going further beyond  
Conventional NMR

NMR



**STELAR**

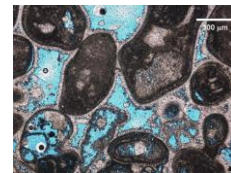
Increase your **CORE** knowledge with.....



### SPINMASTER FFC2000 0.5T Wide Bore

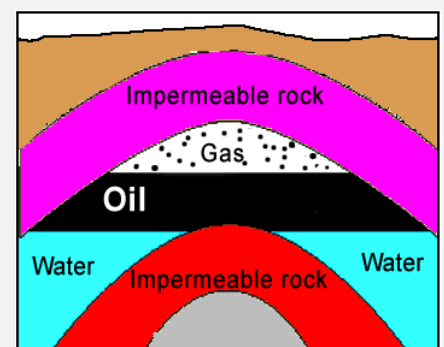
**Fast Field Cycling NMR Relaxometer**  
With special 40 mm internal bore FFC magnet  
and probes

**For 1" and 1.5" ROCK CORE ANALYSIS**



**Measuring  $T_1$  dependency on field strength through FFC provides better understanding of:**

- ✓ **Porosity**
- ✓ **Surface affinity of water in pores**
- ✓ **Pore connectivity**
- ✓ **Wettability**
- ✓ **Moveable fluid volume (BVM)**
- ✓ **Bulk volume of irreducible water (BVI)**



**Knowledge of these parameters may help improve oil extraction processes**

**SPINMASTER FFC2000 0.5T Wide Bore is an added complement to current rock core analysis techniques**

## SYSTEM FEATURES



SPINMASTER FFC2000 0.5T Wide Bore is a unique NMR instrument designed to measure the field dependence of the NMR longitudinal spin-lattice relaxation time,  $T_1$  for rock cores and large samples up to 1" or 1.5" diameter. The transverse spin-spin relaxation time,  $T_2$ , may also be measured (contact Stelar for details).

- ✓ **Measurement of relaxation times from a fraction of a millisecond to several seconds**
- ✓ **Fully automated acquisition of NMRD profiles from 10 kHz to 20 MHz ( $^1\text{H}$  Larmor frequency)**
- ✓ **Measures large samples with up to 1" or 1.5" diameter such as rock cores**
- ✓ **Multi-nuclear operations**
- ✓ **Efficient and accurate temperature control (range from -140 °C to +140 °C with a 0.1 °C resolution)**
- ✓ **Minimum operating costs (no cryogenic gases necessary)**
- ✓ **No complicated sample preparation required**

## MAIN SPECIFICATIONS

### Magnet

Resistive, low inductivity, 2-layer air-core solenoid suitable for Fast Field Cycling NMR measurements.

The magnet is housed in a custom glass-Perspex container and percolated by a special cooling liquid.

*Access bore:* 40mm

*Max Field  $B_0$ :* 0.5 Tesla  $\pm 10\%$  (20 MHz  $^1\text{H}$  Larmor frequency)

*Homogeneity:* < 150 ppm on 1cm<sup>3</sup>

*Field switching time:* < 3 ms (at 10 MHz field jump)

### Power supply

High stability computer-controlled bipolar current source. The system is fully software-controlled.

*Maximum power:* 20 kW

*Maximum current:* 430 A

*Current stability:* < 50 ppm

*Switchable levels:* 4 software-controlled levels

(off, Bpol, Brelax, Bacq)

*Switching time:* < 150  $\mu\text{s}$  / MHz

*Mains:* 400 VAC / 22kW 50/60 Hz

### Probes

1" probe tunable from 10 to 20 MHz (special 1.5" probes available on request).

**Space requirements:** 10 m<sup>2</sup>

### Cooling System

Dual independent, thermally coupled loops.

The hermetically closed secondary circuit uses a room temperature cooling fluid.

The primary circuit uses tap water at 15 °C and 0.7 bar pressure.

### NMR Console

Stelar digital NMR console (PCNMR) with research grade versatility:

Digital receiver with direct detection from 500 kHz to 80 MHz, with a maximum spectral width of 10 MHz.

Three independent RF TX channels, each programmable from DC to 80 MHz.

128 bit / 20 ns / 7 loops levels pulser.

250 W RF linear power pulse transmitter from 500 kHz to 150 MHz.

NMR software package with an ample sequence/experiment library for Fast Field Cycling experiments as well as for most classical NMR, NMR diffusion and NQR applications.

### Variable Temperature Controller (VTC90)

Standard gas flow system.

*Temperature range:* -140°C to +140 °C

*Precision and stability:* 0.1 °C