The Functionality of the Magnetic Measurement Program for Rotating Coil Measurements

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Outline

- Introduction
- A simple and complete structure
- Results reliability

  Measurement preparation

  Measurement run

  Results display
- Conclusions

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Introduction

- 70's: first rotating coils at CERN on LEP quadrupoles and superconducting magnets
- Programming languages:
  FORTRAN then C
- First labview program in March 1995
- Actual version improved with experience

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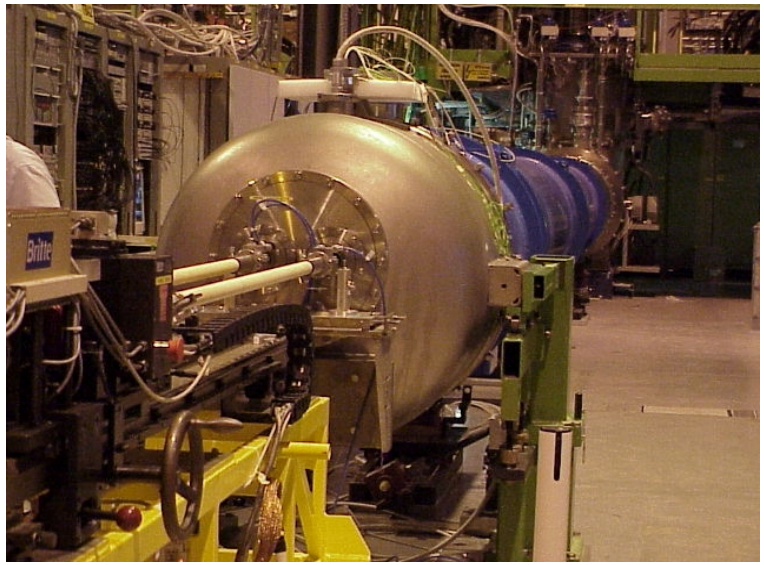
- Program must be easy to use, of general purpose, adapted to user
- Measurements should be valid for analysis
- Actual version mainly developed for LHC superconducting magnets series tests



Its functionality

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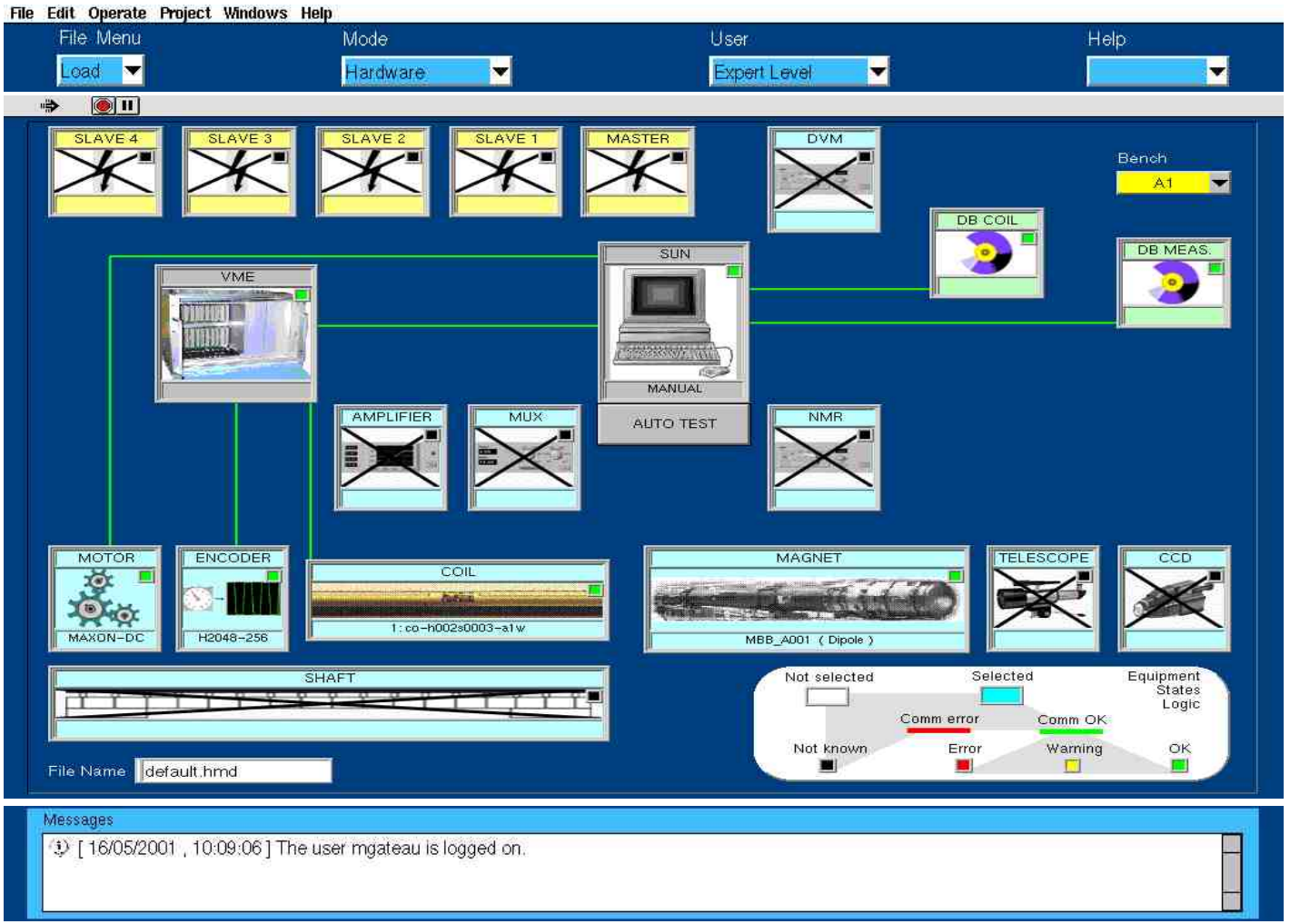
A simple and complete structure



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- Software configuration with respect to measurement equipment
- Last update of coils calibration factors transferred from database
- Access from server to shared power supplies

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- Possibility to load and save settings
- 5 modes of use for a clear organisation
- Different user levels with different accesses
- Log file which record every action or error message

Results reliability

Measurement preparation

- Communication and devices diagnostics
- Notification whether the selected configuration is suitable
- Possibility to tune integrators offset
- Configuration and display of ADC signals
- Loading of appropriated coils factors
- Choice of: normalisation and measurement type

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Results reliability

Measurement run

- Loading of pre-set current cycles
- Power supply switch on when cycle starts
- Automatic connection to coils signals
- Programmable pre-amplifiers gain set
- Motor rotation speed adaptable wrt field
- On-line display of integrators counts, measurement status, temperature, current

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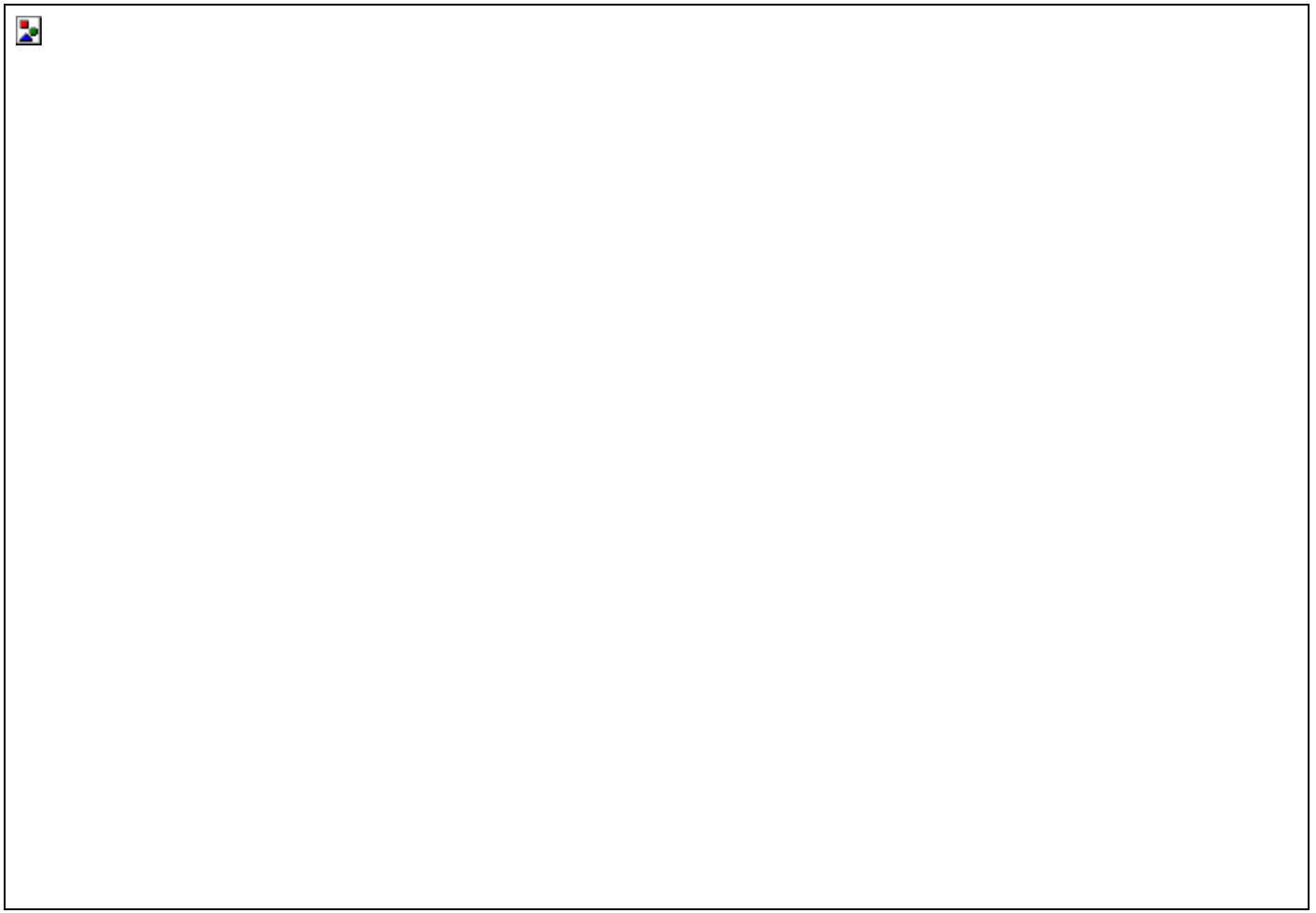
Results reliability

Results display



- Time/frequency analysis of raw-data
- Plots of rotation speed, coils voltage, flux, harmonics
- Drift correction, rotation, normalisation
- Angles, bucking ratio, standard deviation
- "Create results file" option
- Export to database for automatic off-line analysis

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Conclusions

- General purpose configuration: simplest for user and also for maintenance
- Accesses regulation avoid non-consistent manipulations
- Improvement of measurements reliability

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- Maximum measurement efficiency when performing simultaneous measurements
- Software interaction with higher level processes

These functionality will help for time saving which is critical for LHC superconducting magnets series tests

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