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PS/DI Note 99-16 (Min.)
20.5.1999

Minutes of the ABS Meeting held on 20th May 1999

Persons present: M. Arruat, P. Bryant, F. di Maio, S. Hancock, A. Jansson, E. Jensen, M. Lindroos, D. Manglunki, M. Martini, M. Pace, P. Royer, J. Schinzel, Y. Uythoven, E. Wildner.

Topic: ABS software tools

1. WinAGILE (P. Bryant)

The WinAGILE package is a powerful interactive beam optics package freely available from http://nicewww.cern.ch/~bryant. The author, P. Bryant, has included a number of ABS functions in the latest version:

- Closed orbit:
  - Provided a lattice a closed orbit resulting from random errors can be generated, statistics for the orbit excursions is provided.
  - A measured orbit can be read from a file (Ascii format).
  - A correction can be applied (three methods available).
  - A correction can be applied to a certain part of the orbit (leaving other parts untouched).
  - An orbit bump can be created (3, 4 or 5 magnet bumps) from given x and x' values at a specific point. The orbit can later be corrected without 'losing' the bump.
  - A closed orbit can also be generated from a so-called "kick-file".
- Transfer line: the beam can be steered to certain pre-chosen values of x and x' and a certain point in the transfer line.
- On-line HELP available for all functions (manual on its way).

2. BeamOptics99 (P. Royer)

The Mathematica package BeamOptics has been the workhorse of the ABS project since the start of the ABS activities in the PS Division. The package has lately been improved with new functions where quadrupolar lenses are treated as proper long quadrupoles. An overview of the new functionalities in BeamOptics can be found at :

http://nicewww.cern.ch/~lindroos/Abs/Minutes/ABS_Meeting2.html

Word version at:

http://nicewww.cern.ch/~lindroos/Abs/Minutes/ABS_Meeting2.doc)

3. **ABS in PS Operation** (M. Pace)

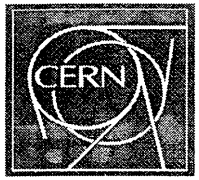
The ABS project aims to provide operation with 'easy-to-use' and 'easy-to-adapt' ABS tools for PS operation. Two years of development have today provided us with a PS optics database (ORACLE based) and a number of generic software modules for ABS application programs. Since the start-up '99, several ABS applications which make use of these facilities have been completed. An overview of these latest developments can be found in the enclosed slides. PowerPoint version:

http://nicewww.cern.ch/~lindroos/Abs/Minutes/20_5_99_myslides.ppt

M. Lindroos.

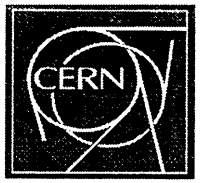
***Distribution*:**

ABS Team
PS/DI Group
PS Group Leaders



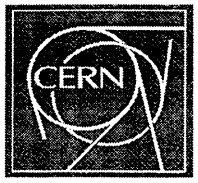
ABS for Operation in 1999

Marine Pace.



ABS 2nd generation-Motivations

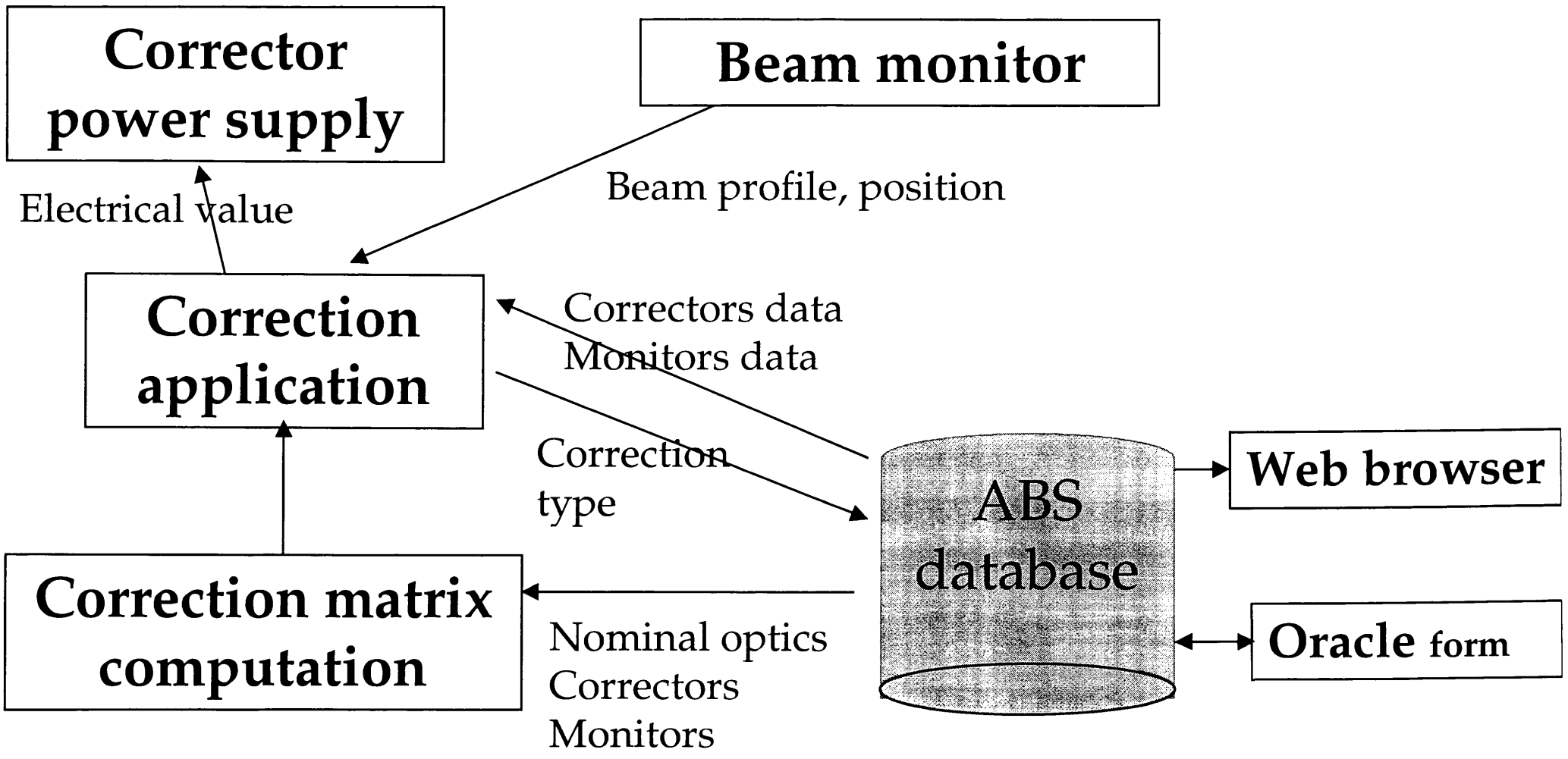
- Existing ABS has been successfully used since 1996 ...
- But it suffers from drawbacks :
  - Several implementations (& duplication) of common procedures
  - Many local files to store optics and machine parameters
  - A dedicated program for each ABS correction
  - Dependence on energy (hard-coded in program)
- => existing ABS too “expensive” to support new corrections

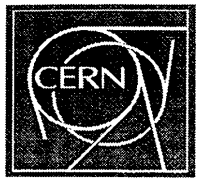


ABS 2nd generation - Aims

- **Data-driven programs**
  - optics + correction data + (matrices) stored in a common DB
- **Generic correction sofware**
  - shared by ALL types of corrections and ALL machines parts
- **NO dedicated ABS programs**
  - is an option available in existing Measurement programs:
- **Independence from particle type and energy**
  - beam rigidity computed on-line for conversion of magnetic parameter into electrical value
- **Very easy to implement a <u>new</u> correction**
  - only requires the description in DB (nominal optics, monitors, correctors)

ABS 2nd generation Control architecture





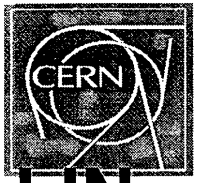
ABS 2nd generation Responsabilities

- DataBase (DB) implementation
  - Josi Schinzel PS/CO
- Machine description in DB
  - CPS , TT2 : Marine, PSB, lines to PS : Mats + Andreas, AD : J-L Mary
- Measurement programs including ABS
  - J-F Comblin, R.Hoh, M.Arruat,…
- ABS correction generic software
  - M.Arruat + J-F Comblin (“Manual” ABS for AD)
- On-line validation of correction
  - Marine, Mats, Michel Martini,...

ABS 2nd generation
Which corrections in 1999 ?

- **PSB : *NEW TRAJECTORY* program (pickups)**
  - LIN - PSB steering (either all 4 rings or 1 single ring)
  - PSB-BTM steering (“ ”)
  - PSB-BTP steering (“ ”)
- **CPS : *ORBIT* program (Codd pickups)**
  - E+, E-, P+ coherent oscillations at injection
  - P+ closed orbit at low energy
- **TT2 : *SEMFILS* program**
  - P+ steering in TT2 for CT-extracted beam , FAST-extracted beam
  - P+ matching in TT2

ABS 2nd generation
Which corrections in 1999 ?



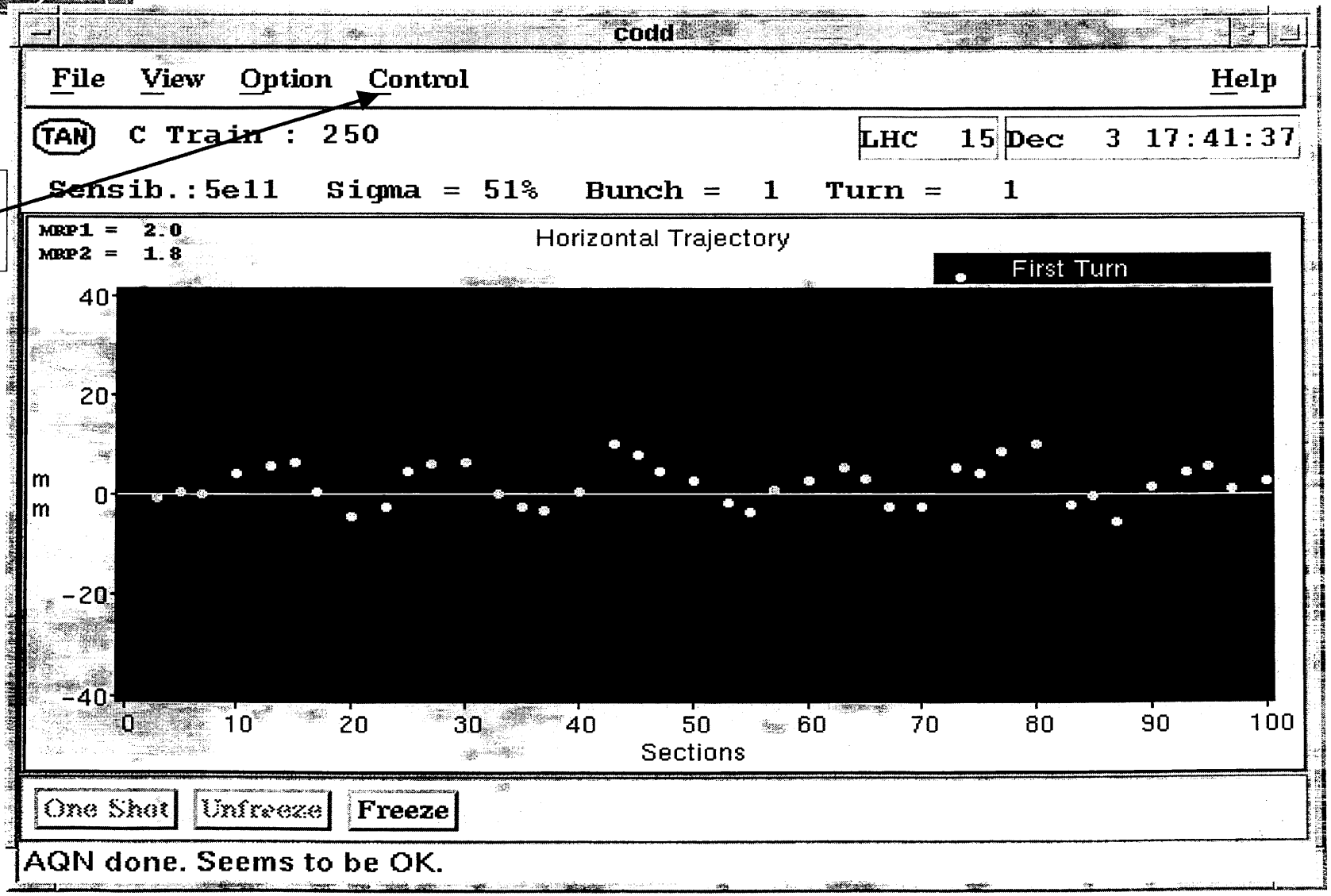
- **LIN - PSB steering (either all 4 rings or 1 single ring)**
  - "New Trajectory" Validated
- **PSB-BTM and PSB-BTP steering (" ")**
  - "New Trajectory" Validated
- **CPS coherent oscillations at injection**
  - "Orbit" Validated (P+), being tested (E+ E-)
- **CPS closed orbit at low energy**
  - "Orbit" Validated (P+), being tested (E+ E-)
- **TT2 steering**
  - "Semfils" Validated
- **TT2 matching**
  - "Semfils" Being tested

ABS included in PS / ORBIT program for :

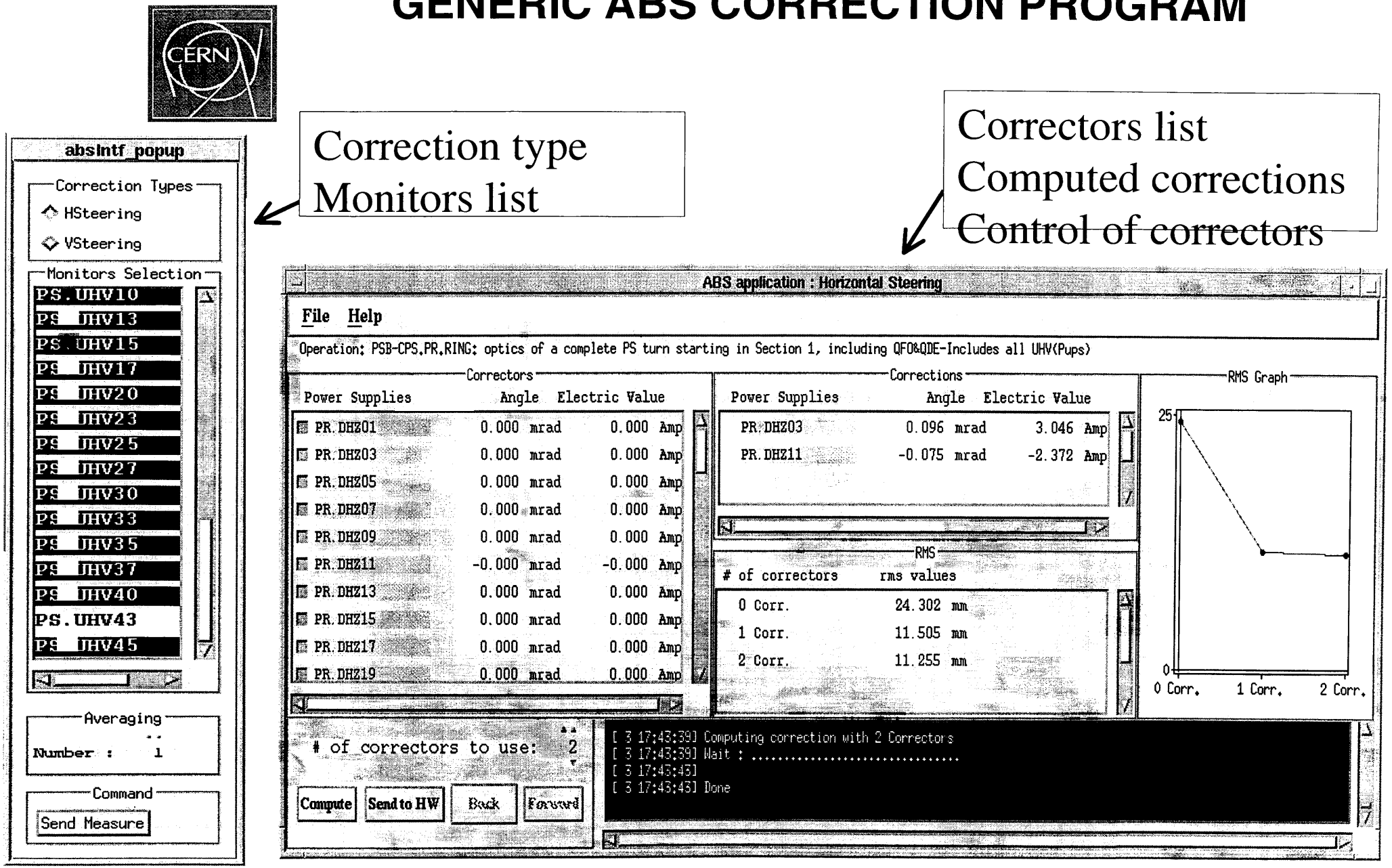
H and V Coherent oscillations at injection (P+, E+, E-)

H and V Closed orbit at low energy (P+, E+, E-)

ABS ON
ABS OFF



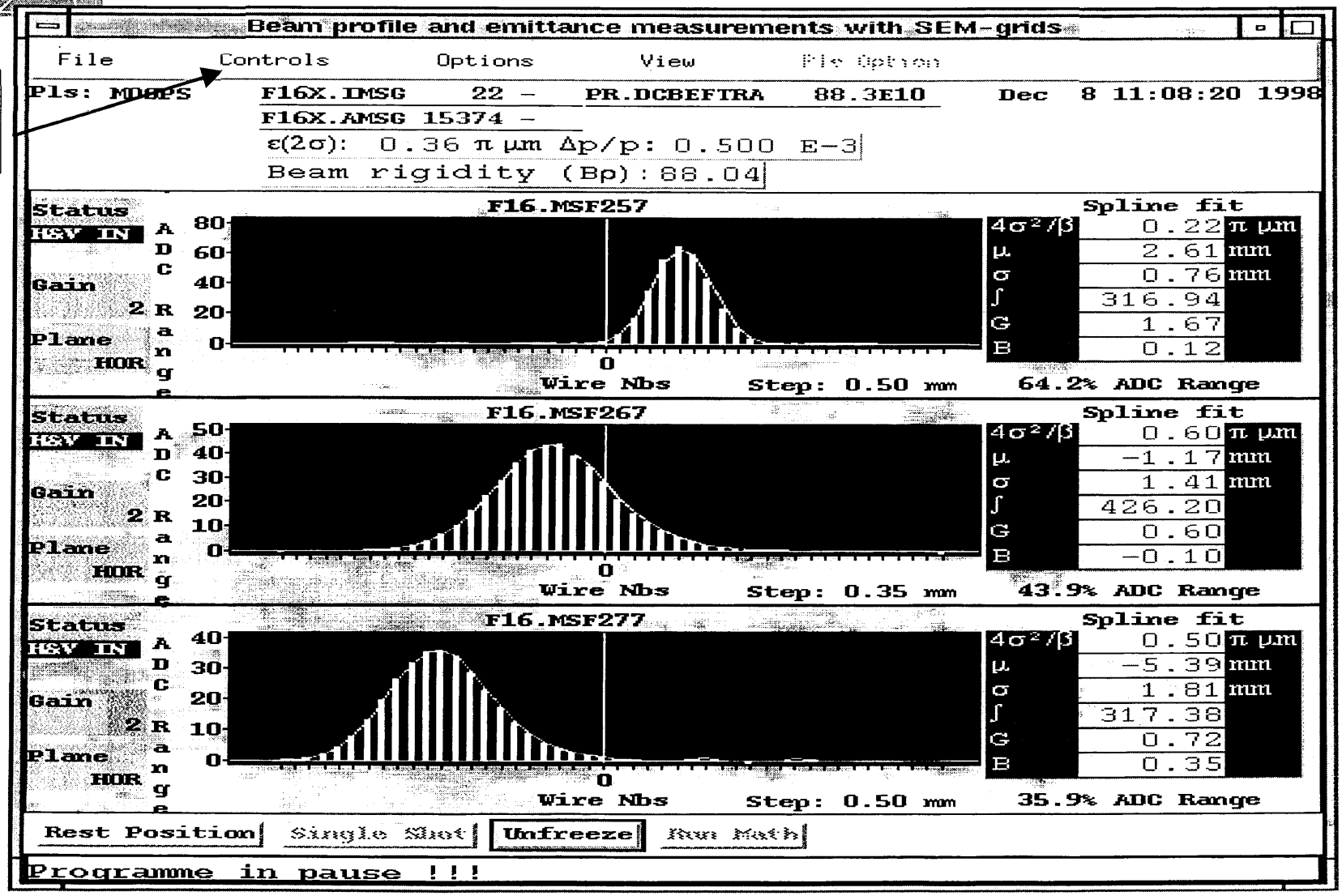
GENERIC ABS CORRECTION PROGRAM



ABS included in SEMFILS/SEMGRIDS program for :

H and V steering and matching corrections

ABS ON
ABS OFF



ABS included in PSB /TRAJECTORY program for :

H and V steering in LIN-PSB (P+)

H and V steering in BTM and BTP (P+)

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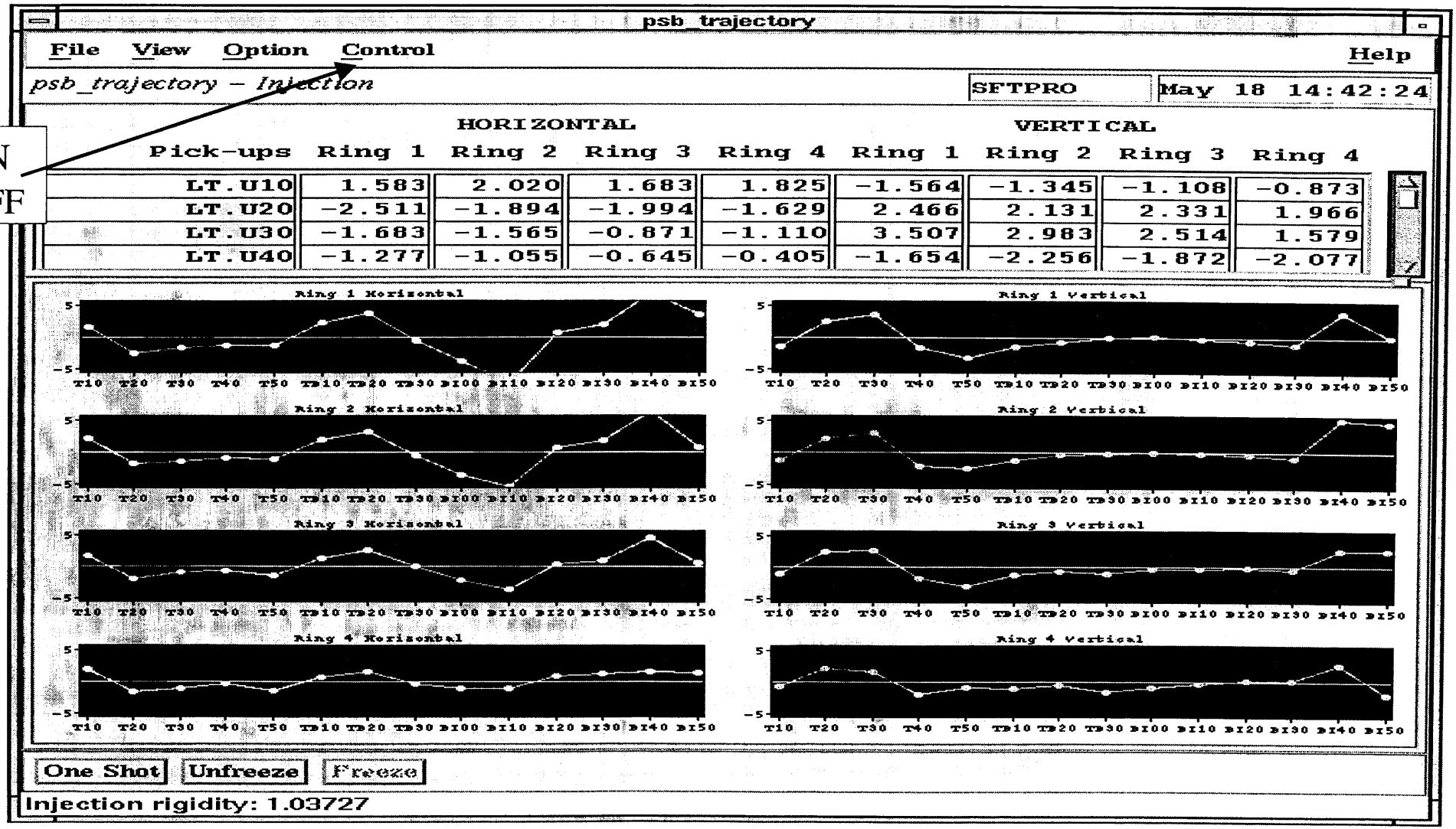
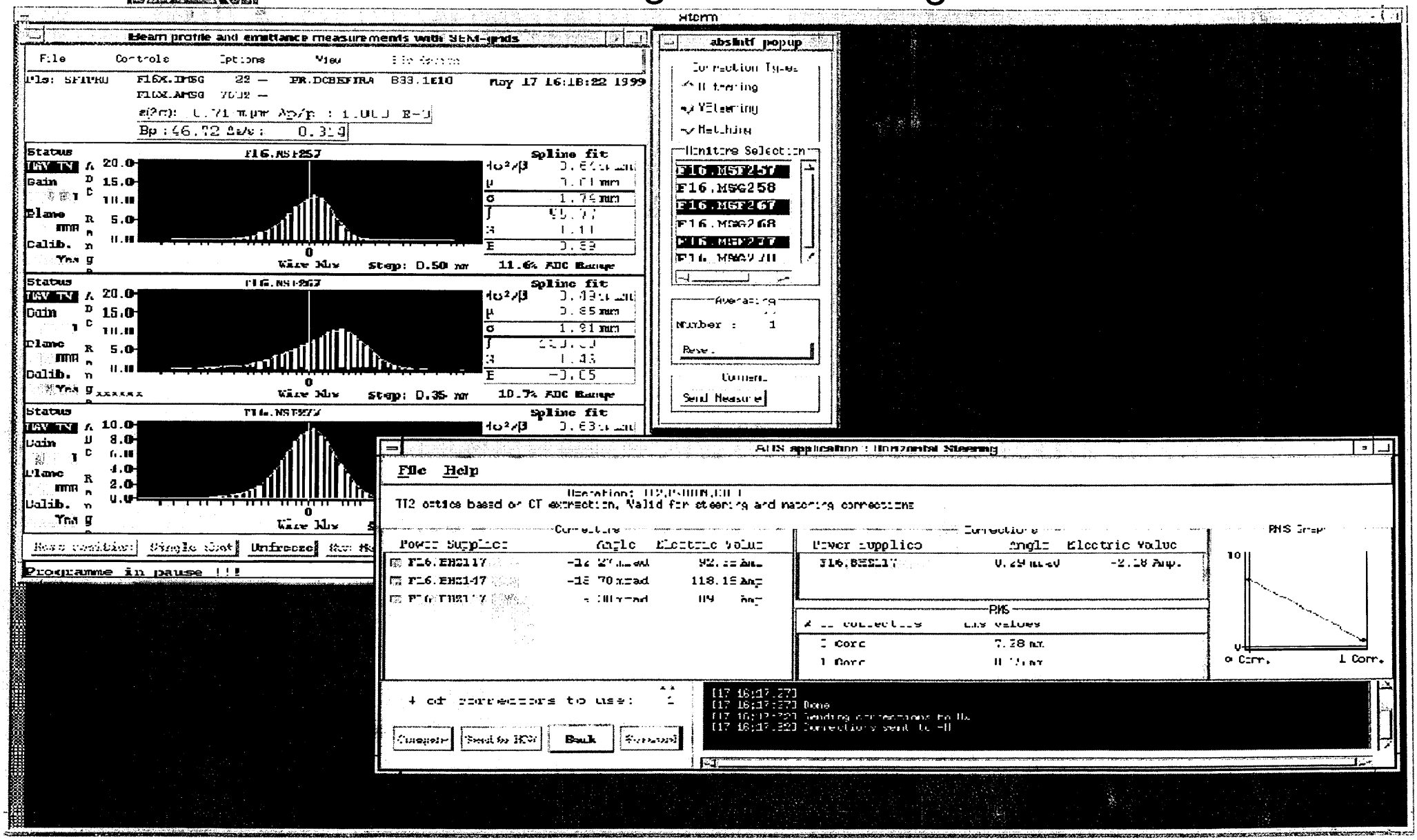
ABS OFF



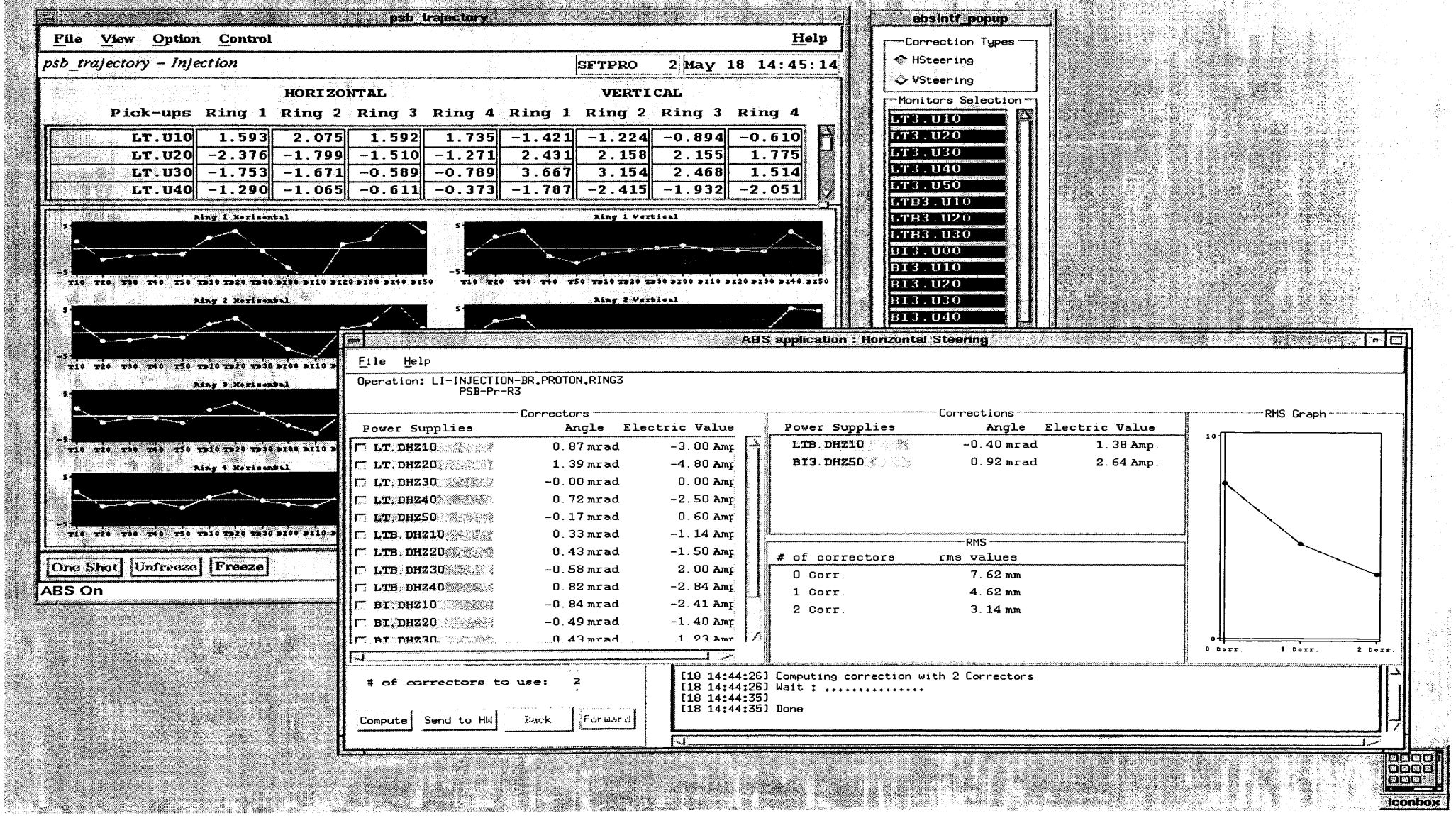
ABS included in SEMFILS/SEMGRIDS program :

H and V steering and matching corrections



ABS included in PSB /TRAJECTORY program :

H and V steering corrections



ABS included in PS / ORBIT program :

H and V Coherent oscillations at injection (P+, E+, E-)

H and V Closed orbit at low energy (P+, E+, E-)