

**Compte rendu de la Réunion Technique du PS N°78
du 20 novembre 1995**

Le ABS : Statut et futur

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C.C.: J. Bosser, P. Bryant, D. Dekkers, K. Hübner, M. Lindroos.

1. B. Autin présente l'état actuel du sujet et constate que sa dernière présentation date du 18 mai 1994 (PS tech. meeting N° 57). Il mentionne que le "S" du titre veut aussi bien dire "shaping" que "steering". Les transparents se trouvent en annexe.
2. A la fin de la présentation technique, le planning des différents sujets (ABS implementation) a été montré ainsi que la liste des personnes impliquées dans le ABS. Au cours de la discussion, il est sorti que l'on doit s'assurer que suffisamment de support soit accordé à ce projet, sinon il risquerait de mourir, ce qui serait dommage car les résultats obtenus à ce jour sont très positifs (malgré les commentaires de certains qui pensent que l'outil ne soit pas suffisamment "user friendly").
3. Il est proposé qu'une réunion ait lieu le mardi 12 décembre à 16h00 avec la présence des chefs de groupe concernés pour définir l'effort des différentes personnes en 1996. B. Autin s'occupe d'organiser cette réunion.

B.W. Allardyce

Basic programs

■ Reference machine

Oracle data base

ACCIS layout

Selector

BeamOptics

Design functions

Controls facilities

■ Linear correction

Dipolar correction

Steering in transfer lines

Coherent oscillations

Closed orbit

Quadrupolar correction

Betatron and dispersion matching in a transfer line

Tunes, beta values and orbit dispersion in closed machines

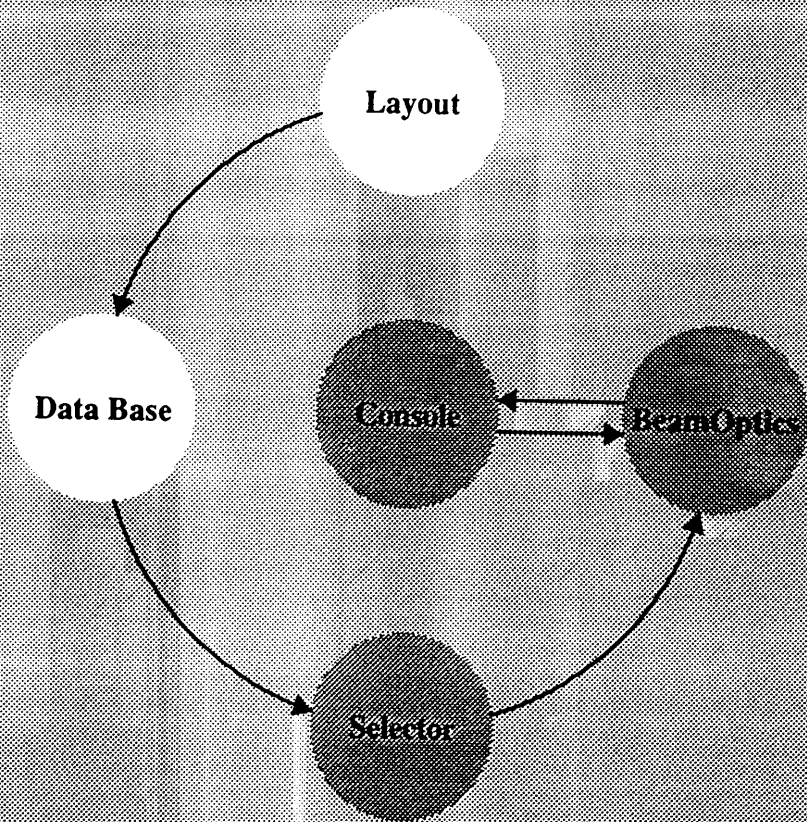
First order multipolar correction

Chromaticity

Chromatic aberrations

Geometric aberrations

Reference Beam



ORACLE Data Base for PSB

Element description

Oracle Forms (Form) Component attributes

Action Edit Block Item Record Query Window Help

Component
 Frozen: Obsolete:

Component attributes

Seq.	Prompt	Attribute
1	Description	Horizontal correction dipole
2	Type	10af
3	Effects beam on level	1234
4	Position (ref. point in sector item) [m]	41.700
5	Position: horizontal offset [mm]	
6	Position: vertical offset [mm]	
7	Level (PSB ring level)	
8	1: Bdl [Tm]	0.00359
9	1: Bdl at current [A]	10
10	2: Bdl [Tm]	
11	2: Bdl at current [A]	
12	Magnetic length [mm]	400
13	Mechanical length [mm]	295

Component number 1: displaying attributes for only 13 items
Page 33

Booster layout

Graphics

File Edit Window Help

Graphics: MAVLOY.OGR Main Layout

Graphics: MAVLOY.OGR CONTROL

CONTROL PANEL

Message:

Showing Information: medium

```

-PSB (PSBOOSTER)
  -BI (PSBOOSTER)
    -BR (PSBOOSTER)
      -PERIOD 1 (PSBOOSTER)
      -PERIOD 2 (PSBOOSTER)
      -PERIOD 3 (PSBOOSTER)
      -PERIOD 4 (PSBOOSTER)
      -PERIOD 5 (PSBOOSTER)
      -PERIOD 6 (PSBOOSTER)
      -PERIOD 7 (PSBOOSTER)
      -PERIOD 8 (PSBOOSTER)
        -BRS1 (PSBOOSTER)
          -BRI.QN08L1 (PSBOOSTER)
          -BRI.ON08L1 (PSBOOSTER)
          -BRI.XN08L1 (PSBOOSTER)
          -BRI.DH28L1 (PSBOOSTER)
          -BRI.DV28L1 (PSBOOSTER)
          -BRI.TS28L1 (PSBOOSTER)
          -BRI.JW28L1 (PSBOOSTER)
          -BRI.UP28L1 (PSBOOSTER)
          -BRI.BH28L1 (PSBOOSTER)
          -BRI.SL28L1 (PSBOOSTER)
          -BRI.QF08L1 (PSBOOSTER)
          -BRI.QN08L3 (PSBOOSTER)
          -BRI.ON08H08L3 (PSBOOSTER)
          -BRI.XN08H08L3 (PSBOOSTER)
          -BRI.UE28L3 (PSBOOSTER)
          -BRI.QDE28L1 (PSBOOSTER)
    
```

First approach to calculate optics from DB:

BT-Line

Read in program and datafile

```
<</u/autin/Accelerators/beam95.m
d=<</u/mal/in]test.csv;
```

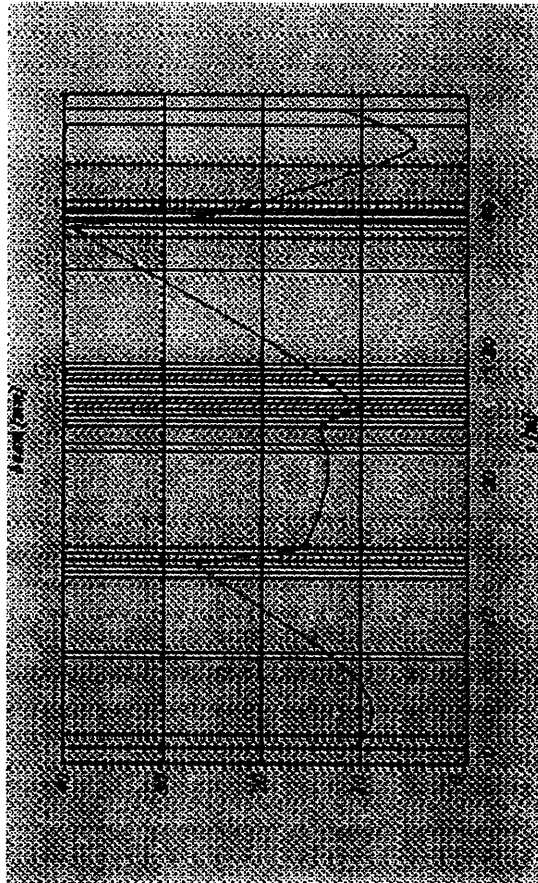
Some polish

(needed for the time being because of use of excel ...)

```
rl= {Null
->0};
dr1=d/.rl;
data=Drop[Transpose[Drop[Transpose[Partition[dr1,.11],1]],{1,2}]];
top=Flatten[Take[Transpose[data],1]];
```

Calculate Horizontal Beam Envelope

```
dvh=DVector[0,0];
{emb, dph}={20*10^-6,0};
BeamPlot[ch, sigmah, dvh, emb, dph];
```



That's all we need to do !!
Just to write the interface...

reference .cam

for linac - PSB

transfer line

1. Beam Envelope [u]

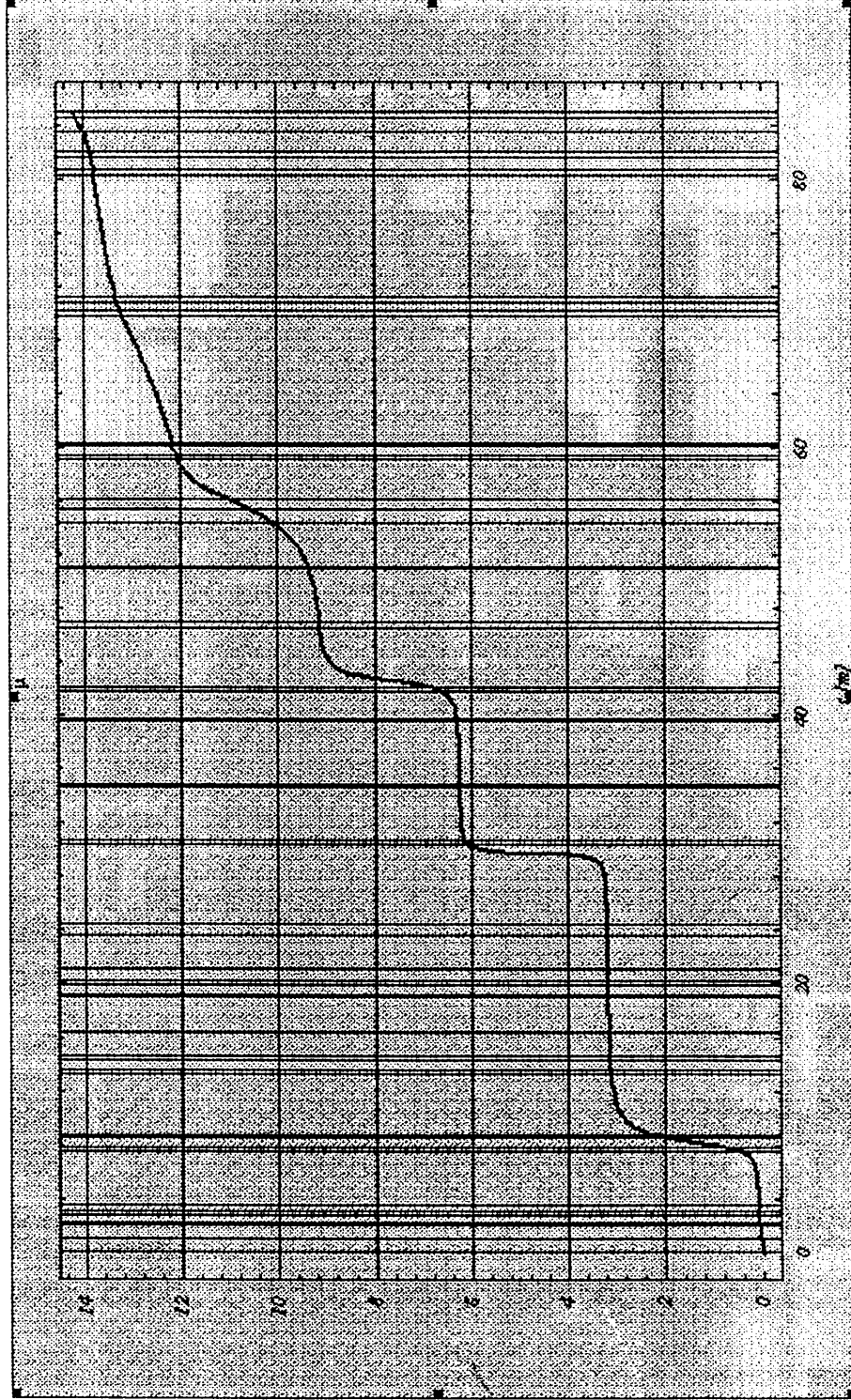
2. M_u variations

~/mat/steering/OptLI LIB.ma

Help

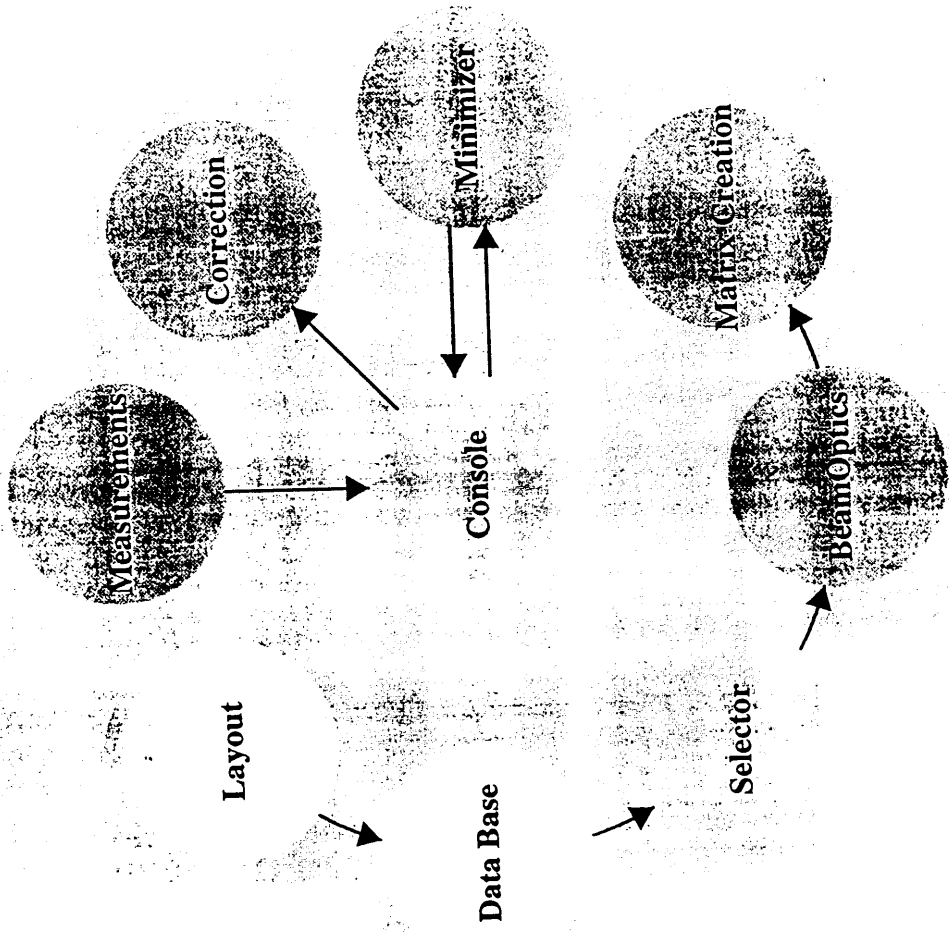
File Edit Cell Graph Find Action Style Window

MatPlot[ch1.si,0]



-Graphics-

Linear Correction



Correction Ring 3 Horizontal

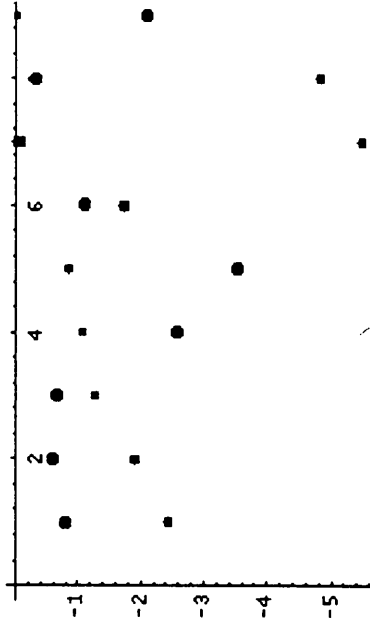
Read positions and corrector settings

Correction and verification

```

Micado[FullList,MBorList,Horizontal,PosPosition,1,
MonitorFile->"/u/mal/steering/mon3.opt",
CorrectorFile->"/u/mal/steering/corrtot3.opt",
MatrixFile->"/u/mal/steering/matot3h.opt",
OutputFile->"/tmp/output.dat"]
micres=<</tmp/output.dat;
g1=ListPlot[micres[[4]],PlotStyle->{PointSize[.02]},
RGBColor[1,0,0],DisplayFunction->Identity];
g2=ListPlot[micres[[6]],PlotStyle->{PointSize[.025]},
RGBColor[0,0,1],DisplayFunction->Identity];
Show[g1,g2,DisplayFunction->${DisplayFunction}]
{{6.10471, 5.12728}, {4}, {-2.41134}}

```



-Graphics-

```

newCorrCurrent=
correctorSetting[FullCorList,nominalCorrCurrent,micres,
SettingFile->"/tmp/set3h.opt",
Reset->False
]

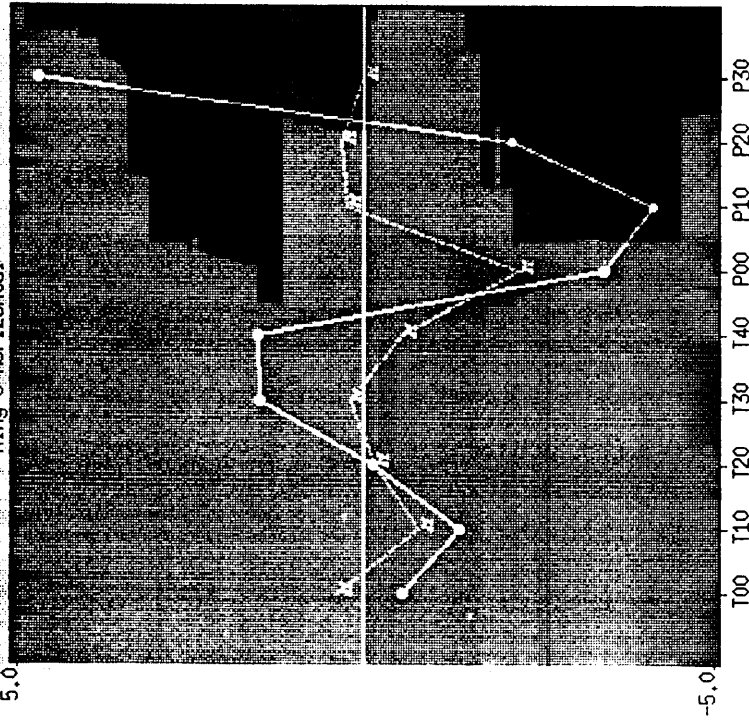
```

Status of
transfer from
PSB to PS
in 94

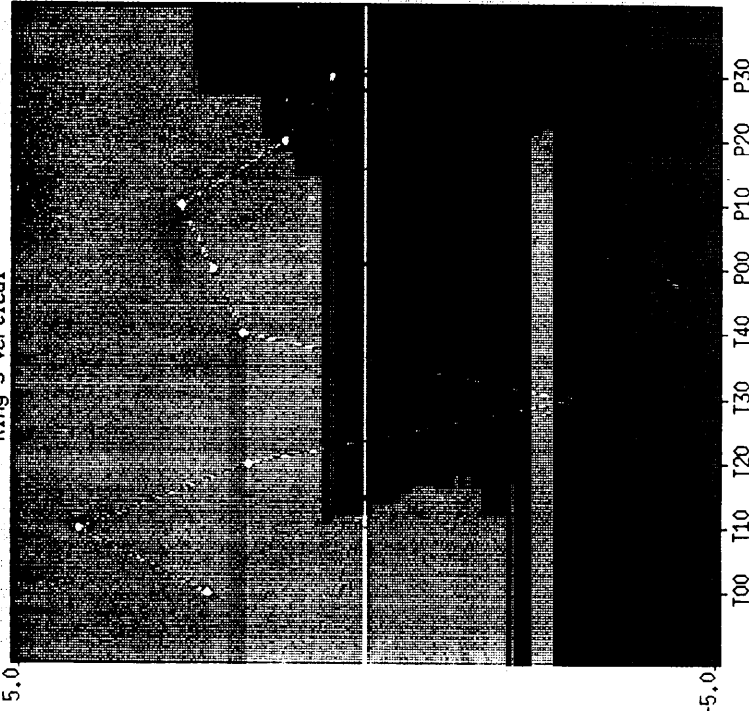
Equipments Horizontal Vertical
R3 R3

BT,U10	1.30	4.44
BT,U20	0.14	0.08
BT,U30	1.11	-2.36
BT,U40	1.35	0.04
BTP,U00	0.05	0.19
BTP,U10	0.11	0.21
BTP,U20	0.14	1.14
BTP,U30	0.40	0.08

Ring 3 Horizontal



Ring 3 Vertical



Status of
Transfer from
Booster to PS
in QS

1. Trajectory
display

2. Correction display

Mathematica

ABS

Data to send to MathLink

Ring

Ring 3

Plane

Vertical

Reference

Zero

Nbr of Correctors

3

RMS

initial

7.09

Corrector 1

6.12

Corrector 2

3.78

Corrector 3

3.34

Correctors

BT.DVT50

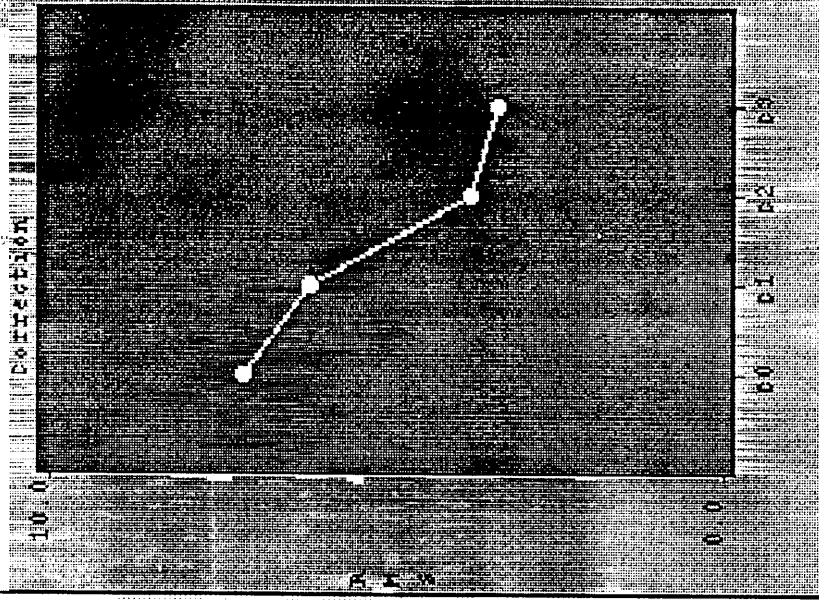
2.97 A

BE3.DVT11L1

-4.06 A

BT.DVT60

-1.51 A



Dismiss

Send To HW

Compute

ABS implementation in the PS complex

	to PSB	PSB	to PS	PS (p)	PS (e)	to SPS	to ISOLDE
Data Base	95	95	95	96	96	97	96
Selector	96	96	96	96	96	97	97
Reference beam	95	94	94	94	94	94-97	94
Graphics interface	96	96	96	96	96	97	97
Steering or coherent oscillations	96	96	95	94	95	94-97	97
Closed orbit	--	96	--	95	95	--	--
Graphics interface	95	96	95	94	95	94-97	97
Betatron matching				AFTER 96			
Dispersion matching				WITH THE			
Tune and chromaticity				PRESENT			
Stop-bands				TEAM			

Extension of ABS tools to LHC

■ Physics motivation

EMITTANCE CONSERVATION

■ Argument

Rigorous treatment of controls, software and instrumentation through a unified package fully tested before LHC operation.

■ Required improvements

Program standardization

Further analysis of genericity

Write specifications for a possible collaboration with outside countries (India).

Solving scale problems bound to a large machine

fast access to data base
fast algorithms

ABS team

1995

B. Autin
V. Ducas
G.H. Hemelsoet
O. Jensen
I. Kirsten
M. Lindroos
M. Martini
E. Wildner

1996

B. Autin
V. Ducas
G.H. Hemelsoet (.)
O. Jensen
M. Lindroos (.)
M. Martini(.)
E. Wildner (.)

Needs: 1 fellow or associate for development of algorithms
1 fellow or associate for application programs
2 staff for further work on PSB and PS

Special ABS Meeting
Tuesday, December 12 at 16 hrs
PS Large Conference Room
Agenda: ABS staff