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Booster Parameter List

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BOOSTER PARAMETER LIST

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ABSTRACT

THIS NOTE DESCRIBES THE PARAMETER LIST FOR THE AGS - BOOSTER. A SCHEMATIC LAYOUT OF THE LATTICE AND ITS SUPERPERIODS ARE ALSO INCLUDED.

INTRODUCTION

In this note we describe the parameter list of the AGS - Booster. In section II the present values of the Booster parameters are tabulated. This updates the Booster parameter list given in References 1 and 2. Schematic diagrams of the lattice [3,4] showing the layout of the AGS Booster, the labling convention of the lattice and its superperiods are also included.

References:

1. AGS Booster Conceptual Design Report, Vol.I, (April 1984);
   AGS Booster Parameter List, Y.Y. Lee, (Sept. 26, 1985).

2. R & D For The AGS Booster, E.B. Forsyth, (Dec. 12, 1985).

3. Booster Lattice, Booster Tech. Note No. 1, E. Courant and Z. Parsa, (January 15, 1986).

4. Booster Coordinates, Booster Tech. Note No. 3, Z. Parsa, G.F. Dell (January 1986).

AGS BOOSTER PARAMETER LIST

ENERGY [MeV]

INJECTION:

PROTONS	200 MeV
POL PROTONS	200 MeV
HEAVY IONS	> 1 MeV/AMU

[POL == POLARIZED]

EJECTION (MAXIMUM)

PROTONS	1 GeV
POL PROTONS	1 GeV
HEAVY IONS	P = 5 Q/A GeV/AMU

[Q is the charge of the Heavy Ions (whether fully stripped or not) delivered from the Tandem.]

LATTICE

CIRCUMFERENCE	201.78 M (1/4 AGS)
PERIODICITY	6
NUMBER OF CELLS	24 FODO [SEPARATE FUNCTION, MISSING DIPOLES]
LENGTH	8.4075 M
PHASE ADVANCE/CELL	71.25
QX ≃ QY	4.75
BETAX MAX/MIN	13.88/3.67 M
BETAY MAX/MIN	13.67/3.80 M

XP MAX	2.94 M
TRANSITION GAMMA	4.795

RF SYSTEM

NUMBER OF STATIONS

1 FOR PROTONS

1 FOR POL PROTONS

2 FOR HEAVY IONS

[where POL== POLARIZED]

HARMONIC NUMBER

3 FOR PROTONS

3 FOR POL PROTONS

3 FOR HEAVY IONS (1 FOR RHIC)

FREQUENCY RANGE (MHz)

FOR PROTONS	2.5	-	3.9	
FOR POL PROTONS	2.5	-	3.9	
FOR HEAVY IONS	0.178	-	2.5	(.06 - .84 FOR RHIC)

PEAK RF VOLTAGE [KV]

FOR PROTONS	35
FOR POL PROTONS	35
FOR HEAVY IONS	17

ACCELERATION TIME [M-SEC]

FOR PROTONS	50
FOR POL PROTONS	50

FOR HEAVY IONS 500

REPETITION RATE

FOR PROTONS 10 Hz (4 PULSES/AGS PULSE)

FOR POL PROTONS 1 Hz (1 PULSE/AGS PULSE)

FOR HEAVY IONS 1 Hz (1 PULSE/AGS PULSE)

DIPOLES

[DIPOLES ARE CURVED AND WEDGED FOR 0 ENTRANCE ANGLE]

NUMBER 36

LENGTH (MAGNETIC) 2.4 M

GAP 82.55 MM

GAP VACUUM CHAMBER 66 MM

GOOD FIELD REGION ($<10^{-4}$) 16 X 6.6 CM

INJECTION FIELD [KG]

FOR PROTONS 1.56

FOR POL PROTONS 1.56

FOR HEAVY IONS 0.105 A/Q

[Q is the charge of the Heavy Ions, (whether fully stripped or not), delivered from the Tandem.]

EJECTION FIELD [KG]

FOR PROTONS 4.0

FOR POL PROTONS 4.0

FOR HEAVY IONS 12.0

LAMINATION THICKNESS 1.5 MM
[0.6 MM AROUND ENDS]

QUADRUPOLES

NUMBER 48

LENGTH (MAGNETIC) 0.50375 M

APERTURE 16.5 CM

VACUUM CHAMBER AP. 15.5 CM

[AP.== APERTURE]

INJECTION POLE TIP FIELD [KG]

FOR PROTONS 1.02

FOR POL PROTONS 1.02

FOR HEAVY IONS 0.068 A/Q

[Q is the charge of the Heavy Ions, (whether fully stripped or not), delivered from the Tandem.]

EJECTION POLE TIP FIELD [KG]

FOR PROTONS 2.7

FOR POL PROTONS 2.7

FOR HEAVY IONS 7.9

LAMINATION THICKNESS 0.6 MM

FIELD QUALITY

SEXTUPOLE HARMONIC (6θ/2θ) 0.0 (SHAPE POLE TIP TO ELIMINATE)

ALL OTHER HARMONICS $< 10^{-4}$

MAX. VACUUM PRESSURE (N2 EQU.) 10^{-10} TORR

MAX. INTENSITY (PARTICLES PER PULSE)

FOR PROTONS	$1 - 1.5 \times 10^{13}$
FOR POL PROTONS	10^{12}
FOR HEAVY IONS	$2 \times 10^{11} / Z$.

Acknowledgement:

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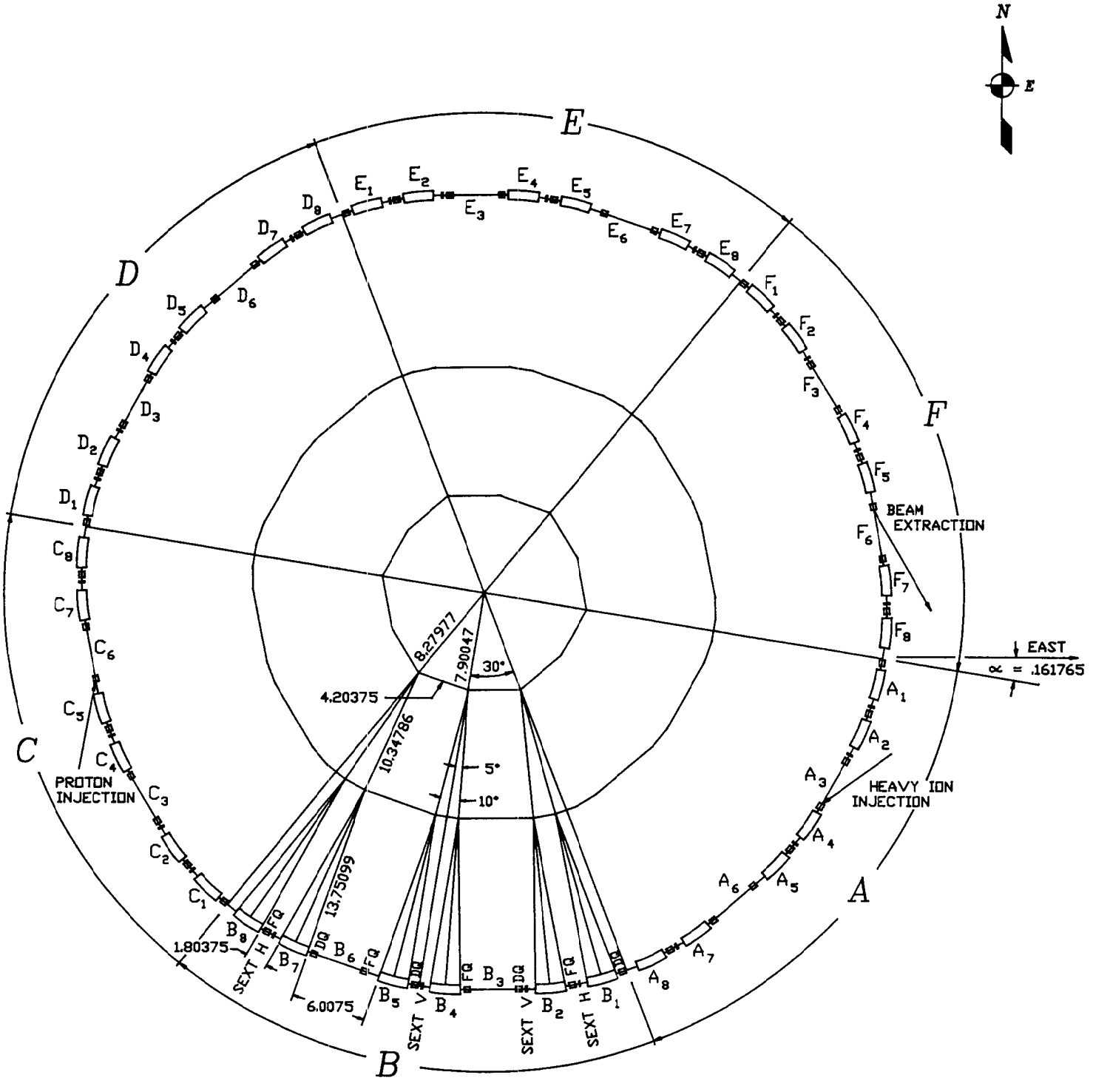

Fig. 1 The Booster Lattice