

**Entry No:** CU-4  
**Machine Name:** Cyclone 30 Cyclotron  
**Date:** 6/1/01 6:03:06 AM  
**Institution:** Instituto de Pesquisas Energeticas e Nucleares  
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#### HISTORY

**Designed By:** Ion Beam Applications - IBA  
**Construction Dates:** 1997-1998  
**First Beam Date:** Aug. 1998  
**CHARACTERISTIC BEAMS**

ions	/ energy(MeV/N)	/current(pps)	/power(w)
H+/H-	15-30	2.18E15	10500

#### transmission efficiency(source to extract beam)

typical: % - best: %

#### tranverse emittance

#### emittance definition:

vertical:  $5\pi$  mm mrad

horizontal:  $10\pi$  mm mrad

longitudinal:  $(\Delta) E/E) \% \times \text{deg RF}$

#### USES

basic research: %	therapy: %
development: %	isotope production: 100%
other: %	maintenance: %
beam tuning: %	Total Time: 500h/year

#### TECHNICAL DATA

a)magnet: type: Compact

Kb: MeV/A Kf: MeV/A

average field (min/max): T

number of magnet sectors: 4

hill angular width: hill angular width

spiral (max): deg

#### pole parameters

diameter: 2.2 m

injection radius: m

extraction radius: 0.7 m

hill gap: m valley gap: m

#### trim coils

-number: x2

-current(max): A-turns

#### harmonic coils

-number: xNsectorsx2

-current(max): A-turns

#### main coils

diameter: x2

total ampere-turns: A-turns

current: 120 A

stored energy: MJ

weight - iron: 45t coils: 4t

#### power

main coils (total): 7.2 kW

trim coils (total max): kW

refrigerator (cryogenic): kW

#### b)RF

#### acceleration

frequency range: 65.5MHz

harmonic modes: 4

number of dees: 2

number of cavities: 4

dee angular width: 30MHz

#### voltage

at injection: kV(peak to ground, max)

at extraction: kV(peak to ground, max)

peak: kV(peak to ground, max)

line power(max): 25kW

#### stability

phase: deg

voltage: %

#### injection

ion source: Multicusp

external injection: Axial

components: Filament

source bias voltage: 2.0 - 2.4kV

injection energy: 0.03MeV/N

#### buncher:

injection efficiency: 30%

#### d)injector:

#### extraction

Stripper Carbon Foil

#### efficiency

typical: 100%

best: %

#### f)vacuum

pumps: Diffusion and Cryo Pumps

achieved vacuum: 4.0E-5Pa

#### REFERENCES

Ion Beam Applications, Technical Description of The Cyclone 30 Cyclotron System for IPEN-CNEN/SP, 1995.

#### EXPERIMENTAL FACILITIES

#### COMMENTS