

Entry: **FM1**
 Machine Name: Synchrocyclotron 200 MeV protons (SC200)
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Date: 15/06/1998
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HISTORY

Design by: Institut de Physique Nucléaire (I.P.N.)/IN2P3/CNRS.

Construction time: 09/1975
 First beam: 20/06/1977

CHARACTERISTIC BEAMS

ions / energy (MeV/n) / current (pps) / power (W) :
 - p / 200 / 12.5 10¹² / 400
 - others possibilities (actually not used) :
 - deuterons, alphas, ³He²⁺
 transmission efficiency (total)
 - typical: 70 % - best: 75 %
 transverse emittance (rms)
 - vertical: 9 π mm²rad
 - horizontal: 10 π mm²rad
 longitudinal emittance (rms) ΔE/E.deg RF

USES

basic research: 0 % therapy: 65 %
 development: 6 % isotope production: 0 %
 other applications: 5 % maintenance: 13 %
 beam tuning: 11 %
 total time: 3080 h/year

TECHNICAL DATA

a) magnet
 type: IRON
 Kb: MeV/A Kf: MeV/A
 average field (min-max): 1.53 - 1.61 T
 number of magnet sectors: \ deg
 - angle: deg
 - spiral (max): deg
 pole parameters
 - diameter: 3.2 m
 - injection radius: 0.01 m
 - extraction radius: 1.4 m
 hill gap: m valley gap: m
 field trimming
 - trim coils
 - number: A
 - current (max): A
 - harmonic coils
 - number: A
 - current (max): A
 - others
 - number: A
 - current (max): A
 main coils:
 - number: 4 A.T.
 - Ampere-turns: 630 000 A.T.
 - current: 630 A
 stored energy: MJ
 weight :- iron: 900 t - coils: 22 t

- variation with radius:
 - oscillator - rotative condensator
 - power in (max): 30 kW
 - stability: - phase: deg - voltage: %

- other cavities
 - purpose: \
 - frequency range: MHz
 - region of influence: m
 - voltage (max): kV
 - power in (max): kW
 - stability:- phase: deg - voltage: %

c) injection

- internal source: PIG hot filament
 - external (radial/axial):
 - elements:
 - source voltage: kV
 - injection energy: MeV/n
 - buncher:

- injection efficiency: %

d) ion sources/injector

e) extraction

- elements, characteristics:
 - Electromagnetic channel
 - Magnetostatic channels (5)
 - efficiency
 - typical: 70 % - best: 75 %

f) vacuum

- pumps: OIL DIFFUSION GALILEO 16 000 l/s
 - achieved vacuum: Pa

REFERENCES

EXPERIMENTAL FACILITIES

PLAN VIEW OF FACILITY

The CPO Facility

