

ENTRY No. 36

NAME OF MACHINE MILAN SUPERC. CYCLOTRON DATE JULY 1981
INSTITUTION UNIVERSITY OF MILAN - I.N.F.N. (ITAL. NATL. INST. FOR NUCL. PHYSICS)
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HISTORY AND STATUS

DESIGN, date 1975-76 Model tests 1977
ENG DESIGN, date 1979
CONSTRUCTION, date STARTED FEB. 1981
FIRST BEAM, date (or goal) 1985 (GOAL)
MAJOR ALTERATIONS

COST, ACCELERATOR APPROX 6 M \$
COST, FACILITY, total
FUNDED BY I.N.F.N.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 12 ENGINEERS 4
TECHNICIANS 10 CRAFTS 8
GRAD STUDENTS involved during year 4
OPERATED BY Research staff or Operators
OPERATION hr/wk, On target hr/wk
TIME DISTR. in house %, Outside %
BUDGET, op & dev
FUNDED BY

RESEARCH STAFF, not included above

USERS, in house outside
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house
FUNDED BY

MAGNET

POLE FACE, diameter (compact) 180 cm, R extraction 86.7 cm
R injection 16-25 cm
GAP, min 8.6 cm, Field 56 kG
max 91.6 cm, Field 40 kG at 6.55 10^6
AVERAGE FIELD at R ext MAX 48 kG Ampere turns
B max/ <B> 1.17

NUMBER OF SECTORS { compact 3 } Spiral, max 69 deg
{ separated }

SECTOR ANGLE (SSC) deg
TRIMMING COILS 20 CONDUCTOR
6x6 mm copper 3 mm hole

CONDUCTOR, material and type MAIN COILS = SUPERC. Nb-Ti
STORED ENERGY (cryogenic) 40 MJ

POWER: main coils max, kW; current stability 10^-4
trimming coils 60 max, kW; current stability 10^-4

WEIGHT: Fe 176 tons; coils 9.7 tons
COOLING system LIQUID Helium bath

ION ENERGY (bending limit) E/A = 800 q^2/a^2 MeV/amu
(focusing limit) E/A = 200 q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 3; angle 58 deg
BEAM APERTURE 2.5 cm; DC Bias kV
TUNED by, coarse SHORT CIRCUIT fine TUNING CAPACITOR
RF 15 to 48 MHz, stable +/- 1 10^-8
Orb F 6 to 25 MHz

HARMONICS, RF/Orb F, used 1, 2, 3, 4
DEE - Gnd, max 100 kV, min gap 1.5 10^-4 cm

STABILITY, (pk-pk noise)/(pk RF volt) 10^-4
ENERGY GAIN, max 600 x (Z/A) kV/turn

RF PHASE, stable to +/- 2 deg
RF POWER input, max 180 kW

FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 10^-7 Torr or mbar
PUMPS, No, Type, Size CRYOPANELS - GETTERS

ION SOURCES

INTERNAL (P.I.G.) - EXTERNAL (UNDECIDED)

INJECTION SYSTEM

AXIAL AND RADIAL FROM 16 MV TANDEM

EXTRACTION SYSTEM

ELECTROSTATIC + MAGNETIC

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m^2; movable m^2
TARGET STATIONS in rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Includes data for q/A = .5 and .4.

SECONDARY

(part/s)

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH RF deg pA of MeV ions
PHASE EXC, max RF deg pA of MeV ions
EXTRACT eff % pA of MeV ions
RESOL DE/E % pA of MeV ions
EMITTANCE

(pi mm. mrad) { axial } pA of MeV ions
{ rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS