

ENTRY No. CU34

NAME OF MACHINE . ISPPA CYCLOTRON DATE
INSTITUTION . JOINT RESEARCH CENTRE . ADVANCED MATERIALS INSTITUTE
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IN CHARGE CASTIGLIONI, M REPORTED BY CASTIGLIONI, M

HISTORY AND STATUS

DESIGN, date Model tests
ENG DESIGN, date MC-40 SCANDITRONIX
CONSTRUCTION, date
FIRST BEAM, date (or goal) 1982
MAJOR ALTERATIONS

COST, ACCELERATOR 9×10^6 SKR
COST, FACILITY, total 1.1×10^7 SKR (EXCL. BLD.)

FUNDED BY E.E.C.
ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 1 ENGINEERS 2
TECHNICIANS 1 CRAFTS 2

GRAD STUDENTS involved during year
OPERATED BY Research staff or 5 Operators
OPERATION 55 hr/wk, On target 44 hr/wk
TIME DISTR. in house 70% Outside 30%
BUDGET, op & dev 2.0×10^5 ECU

FUNDED BY E.E.C.
RESEARCH STAFF, not included above
USERS, in house 6 outside 6
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house $A.5 \times 10^5$ ECU

FUNDED BY E.E.C.
MAGNET
POLE FACE, diameter (compact) 135. cm, R extraction 50. cm
R injection cm
GAP, min 10. cm, Field 21.2. kG }
max 18. cm, Field 13.3. kG } at 241,000.
AVERAGE FIELD at R ext 17.9. kG } Ampere turns
B max/ 1.19

NUMBER OF SECTORS { compact 3 } Spiral, max 45 deg
separated }
SECTOR ANGLE (SSC) deg
TRIMMING COILS 4. CIRCULAR COILS
CONDUCTOR, material and type Cu

STORED ENERGY (cryogenic) MJ
POWER: main coils 100. max, kW; current stability 10^{-5}
trimming coils 10. max, kW; current stability 10^{-4}
WEIGHT: Fe 57. tons; coils 2.4. tons
COOLING system DEMINERALIZED WATER

ION ENERGY (bending limit) E/A = $40. q^2/a^2$ MeV/amu
(focusing limit) E/A = q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 2; angle 90. deg
BEAM APERTURE 2. cm; DC Bias 0. kV
TUNED by, coarse MOV. SHORT fine VAR. CAPACITOR
RF 12.5. to 27. MHz, stable $\pm 10^{-6}$
Orb F 6.25. to 27. MHz
HARMONICS, RF/Orb F, used 1 AND 2
DEE - Gnd, max 44. kV, min gap cm
STABILITY, (pk-pk noise)/(pk RF volt) 10^{-3}
ENERGY GAIN, max 176 kV/turn
RF PHASE, stable to \pm 0.5 deg
RF POWER input, imax 60 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width 15. + 20. deg

VACUUM SYSTEM

OPERATING PRESSURE 2×10^{-6} Torr or mbar
PUMPS, No, Type, Size 2. TURBO. MOLECULAR
LEYBOLD HERAEUS, TYPE 3500

ION SOURCES

INTERNAL, COLD CATHODE, AXIALLY MOUNTED

INJECTION SYSTEM

EXTRACTION SYSTEM

ELECTROSTATIC DEFLECTOR, MAGNETIC CHANNEL
FACILITIES FOR RESEARCH
SHIELDED AREA, fixed 280. m²; movable m²
TARGET STATIONS 6. in 3. rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES HELIUM JET COOLING SYSTEM FOR TARGET

CHARACTERISTIC BEAMS

PARTICLE	P	ENERGY (MeV)		CURRENT (pA)	
		Goal	Achieved	Internal	External
PROTONS			38	100	65
DEUTERONS			19	100	65
ALPHAS			38	60	30

SECONDARY

(part/s)

BEAM PROPERTIES

MEASURED	CONDITIONS	
	RF deg	Internal External
PULSE WIDTH	pA of	MeV Ions
PHASE EXC, max	pA of	MeV Ions
EXTRACT eff	pA of	MeV Ions
RESOL $\Delta E/E$	pA of	MeV Ions

EMITTANCE
(π mm. mrad) { axial } pA of MeV Ions
{ rad }

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. 5% ISOTOPE PRODUCTIONS 10%
RADIATION DAMAGE AND ALPHA IMPLANTATION IN FUSION
REACTOR MATERIALS 85%
REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES,
COMMENTS