6. ELECTRON VAN DE GRAFF ACCELERATOR FACILITY

Name of the infrastructure	Electron Van de Graff accelerator facility
Location of infrastructure (town, country)	Madrid, Spain
Web site address	http://www.fusion.ciemat.es/competitive-access-to-facilities/electron-accelerator/
Legal name of organization operating the infrastructure	CIEMAT, Centro de Investigaciones Energéticas Mediambientales y Tecnológicas
Location of organization (town, country)	Madrid, Spain
Key Accelerator Research Area(s)	Van de Graff, material irradiation
General description of the infrastructure	This facility is composed by the following beam characteristics: - Irradiation by electron beam or by Bremsstrahlung - Energy: 0,25 to 2,0 MeV and current 10 pA to 150mA - Samples from 3 mm^2 to about 20x20 cm^2 - At target area unfocussed beam is ~1 cm diameter - Beam can be focussed up to ~1 mm diameter (for small samples) - Beam can be defocussed up to ~3 cm diameter - Beam can be scanned over 20x20 cm^2 (for large samples)
Already existing or planned	Existing
Unique features	Electron irradiation at controlled temperature from 25 C up to 900 C within high vacuum or any gas atmosphere
Present situation/future changes/expected lifetime	Fully operative.
Accelerator infrastructure or component test infrastructure	Homemade special sample holders and irradiation chambers. Measurement in situ of Radioluminescence, Radiation Induced Conductivity and Radiation Induced hydrogen permeation.
Shared facility/infrastructure	Infrastructure dedicated to R&D and service
Main user community	60% in home users; 40% external users form R&D institutions
Number of users	10 different users per year.
Open for external users	Yes
If open to external users: Modality of access to the infrastructure (access unit)	Competitive access
Number of access units available for external users	NA
If open to external users: Support offered by the organization operating the infrastructure	Operation of accelerator, Fully equipped experimental stations (detectors, sample holders, vacuum systems, electronics, etc).Expertise on radiation damage also provided to user
Review procedure for requested access	External evaluation committee
How to apply	Web application via http://www.fusion.ciemat.es/competitive-access-to-facilities/electron-accelerator/
Can the infrastructure be made available?	Yes
If YES, fraction of time that could be made available (%)	Negotiable
Number of FTEs operating the infrastructure	1FTE +3 technicians for infrastructure support
Contact details (name, Institute, email,)	Alejandro Moroño Tecnología de Fusión Division Avenida Complutense, 40 28040, Madrid alejandro.morono@ciemat.es Tel.: +34 91 346 6372
Annual operating costs (excl. Investment costs) of the infrastructure	1M€
if available: costing model (how is the annual operating cost calculated)	If service is delivered to internal CIEMAT clients, costs are calculated on a basis of an all-in fee package. Special conditions may be applicable for tests performed in the frame of approved official cooperation agreements.
Estimated investment cost (replacement value)	12M€

3. ION SOURCE TEST FACILITY

Name of the infrastructure	Ion Source test facility
Location of infrastructure (town, country)	Madrid, Spain
Web site address	http://www.ciemat.es
Legal name of organization operating the infrastructure	CIEMAT, Centro de Investigaciones Energéticas Mediambientales y Tecnológicas
Location of organization (town, country)	Madrid, Spain
Key Accelerator Research Area(s)	Ion source, H- source, cyclotron, vacuum, instrumentation, and diagnostics. Medical accelerators, cathode.
General description of the infrastructure	This facility is composed by the following infrastructures and / or activities: 1.Test station for P.I.G. ion souces: DC and RF extraction. Measurement of beam current with Faraday cups. Plasma density and temperature can be estimated with optical emission spectroscopy and Langmuir probes. 2. NC dipole magnet: 0,85 T 3. Cold Cathode P.I.G. Ion source 4. Beam diagnostics and instrumentation 4. H- gas handling control 5. Vacuum chamber and vacuum system.
Already existing or planned	Existing. Improvement plan: adaptation for measurement of RF ion sources. RF extraction to avoid high voltage.
Present situation/future changes/expected lifetime	No large change presently planned. Expected lifetime: more than 10 years
Accelerator infrastructure or component test infrastructure	Component test infrastructure
Shared facility/infrastructure	Medical Cyclotrons users and R&D Institutes
Main user community	P.I.G. sources for accelerators
Open for external users	yes
If open to external users: Modality of access to the infrastructure (access unit)	There are different modalities to access the facility like a “Service Contract” or a “Collaboration Agreement” among others
Number of access units available for external users	Depending on the availability of the part of the installation needed
If open to external users: Support offered by the organization operating the infrastructure	The equipment is under the responsibility of the CIEMAT, which are in charge of the operation, maintenance and safety issues. CIEMAT agrees to provide the personnel to ensure these functions.
Review procedure for requested access	Either after discussion with CIEMAT, or in the frame of an international contract, European or else
How to apply	By contacting the responsible
Can the infrastructure be made available?	yes
If YES, fraction of time that could be made available (%)	Depending on the internal projects going on, and on the facility needed.
Contact details (name, Institute, email,)	Daniel Gavela Accelerator Unit Avenida Complutense, 40 28040, Madrid daniel.gavela@ciemat.es Tel.: +34 91 496 2573
if available: costing model (how is the annual operating cost calculated)	If service is delivered to internal CIEMAT clients, costs are calculated on a basis of an all-in fee package. Special conditions may be applicable for tests performed in the frame of approved official cooperation agreements.

Pictures

Fig. 4. Ion source test facility

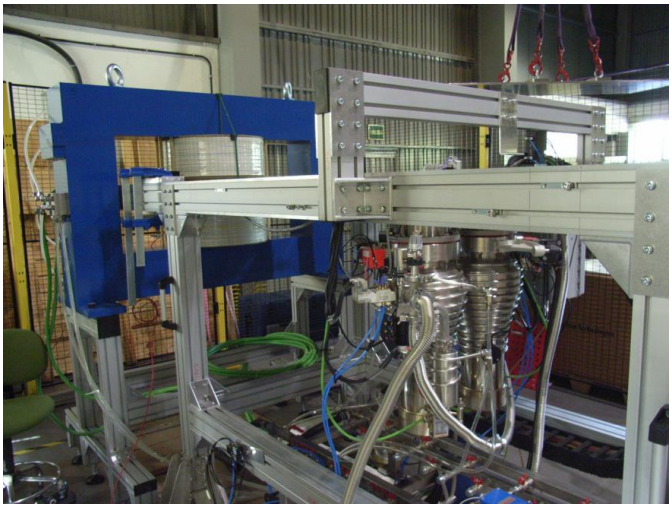

Fig. 5. Overview of the test bench with the mechanical structure, the magnet, the vacuum system, and the refrigeration water distribution system

Fig. 6. A top view inside the vacuum chamber, showing the electrical shielded box, the ion source and the magnet

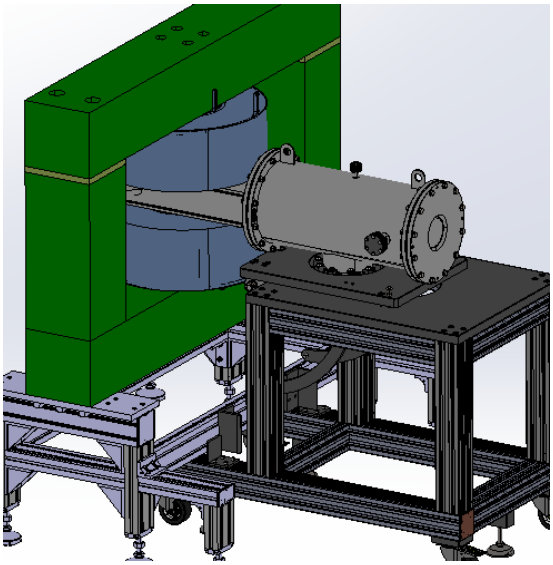

Fig. 7. New Ion source facility with RF extraction