

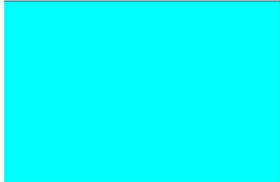


# REP NEWSLETTER

Volume 01, No. 01

January 21, 2014

## FEL CHAMBER

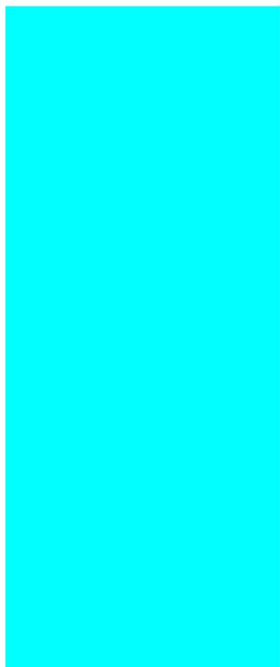


starting from spherical body



tube welding

assembling



To growth high quality thin film multilayers , sample surface must be arranged.

In this Fast Entry Lock (FEL) these performances are connected:

- RF etching
- IR bake out
- electron beam
- ion rastering
- electrical metallic contacts

After getting vacuum in the  $10^{-9}$  mbar, sample is moved into the growing chamber

*sponsored by* : CNR - IOM Istituto Officina Materiali - Drssa Roberta Ciprian

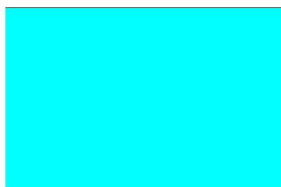


# REP NEWSLETTER

Volume 01, No. 02

February 21, 2014

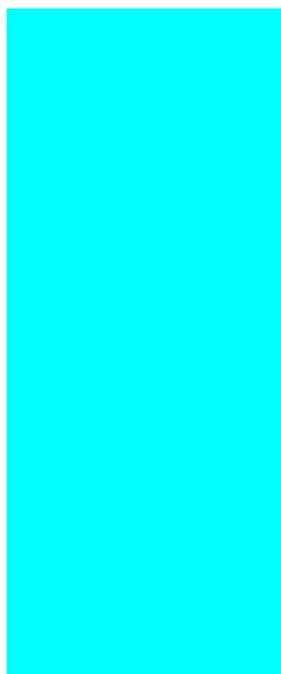
## HIGH VOLTAGE



30KV-1A feedthrough on CF4 1/2"



25KV-1A feedthrough on CF63



Crossed Molecular Beam (CMB) scattering technique with rotating mass spectrometric detection and time-of-flight analysis is used at Chemistry Dpt of Perugia to measure reactive differential cross sections for elementary chemical reactions of importance from a fundamental point of view and in areas of practical interest, such as atmospheric-, combustion- and astro-chemistry.

At the same time, the CMB apparatus was equipped, for the first time in this kind of instruments, with the possibility of crossing the two reactant beams at angles both lower (45 degrees) and higher (135 degrees) than the usual 90 degrees. This permits to extend the range of collision energies (both on the low and high-energy side) that can be attained, and it is of importance for astrochemistry and combustion relevant reactions, respectively.

To improve the performances of some beams, high voltage devices has been implemented to lower the noise ratio.

*sponsored by : Chemistry Dpt-Perugia University-Prof.P.Casavecchia*

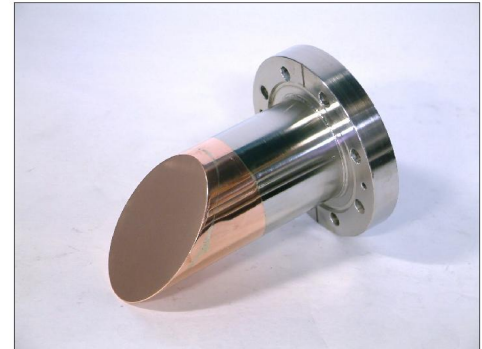
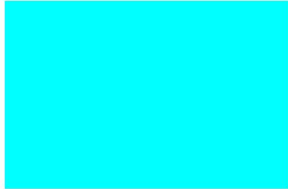


# REP NEWSLETTER

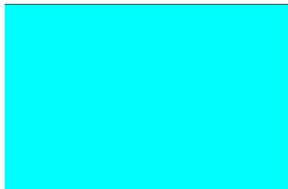
Volume 01, No. 03

March 31, 2014

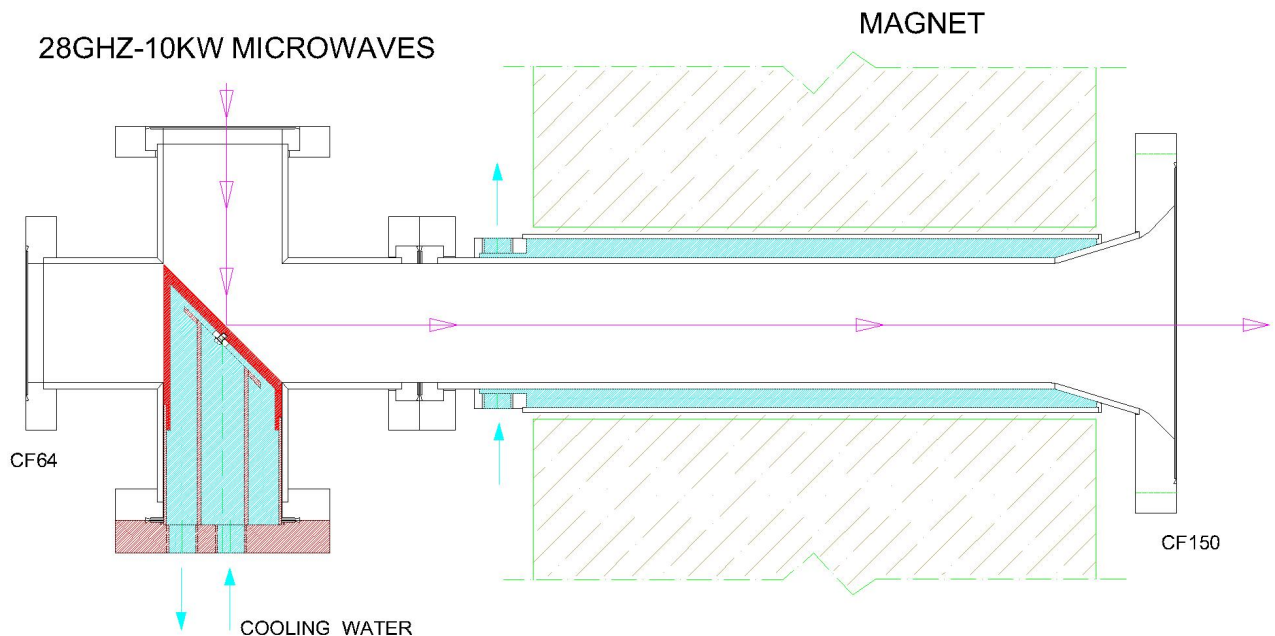
## 28 GHz MIRROR



28GHZ Mirror and Thrower



A new high density plasma source is being to be built in IFP-CNR Milan. The source is based on Electron Cyclotron Resonance (ECR) phenomena induced by microwave at 28GHz, up to 10kW, in a static magnetic field. The microwave mirror is needed to prevent the back stream of plasma to a microwave vacuum-proof window, thank to the Cu mirror the microwaves are sent to the thrower, with low power losses, located inside magnets generating up to 1T field necessary for ECR and plasma generation. Both the mirror and the thrower are watercooled against microwaves power losses and the plasma heat load.



sponsored by : CNR-IFP MILAN-ITALY - Dr. Marco De Angeli

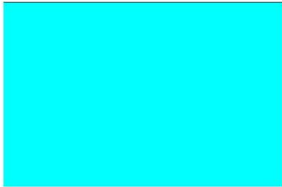


# REP NEWSLETTER

Volume 01, No. 04

April 20, 2014

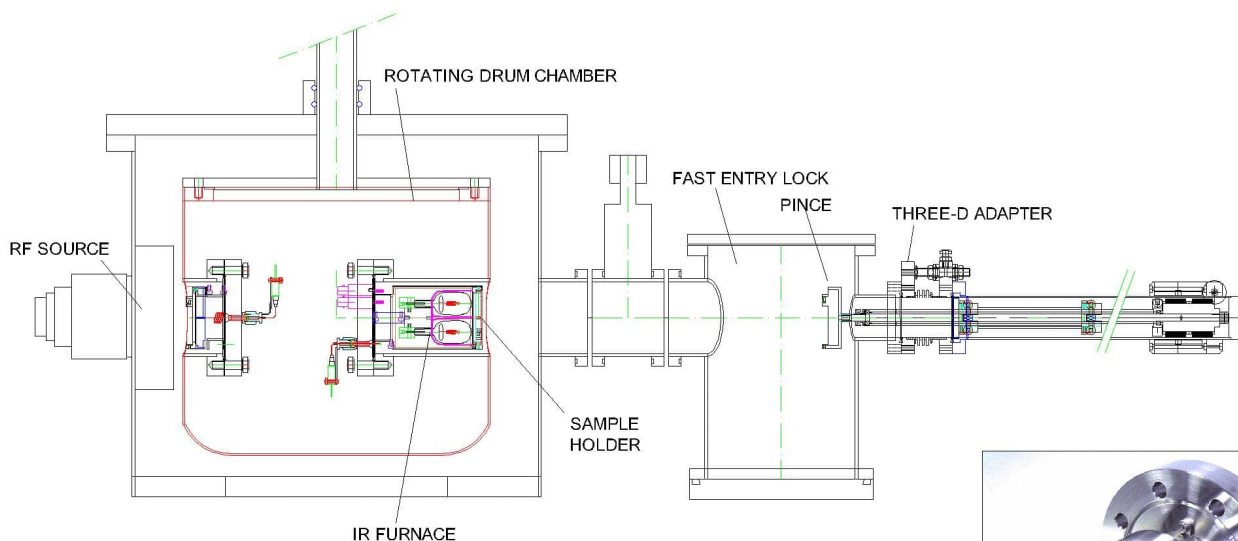
## 2 RF SAMPLE HOLDER



CF64 Supports for 2" RF sample holder and transfer pince



Two Deposition Sample Stations (DSS) for homemade RF magnetron have been designed. The 2" diam transferable sample holder is introduced into the RF magnetron chamber through a Fast Entry Lock (FEL) by a special adapter magnetic manipulator. One DSS is equipped with a 2KW IR source to heat the sample till to 900°C. A rotating drum expose the sample in sequence to three RF sources; gold , silver , nichel and other combinations are coated into thin films.



0.5mm diam Inconel sheathed K thermocouple

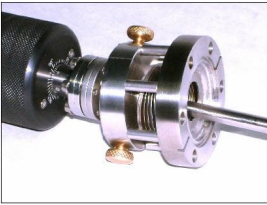
sponsored by : CNR-IMEM Parma Italy - Dr.Casoli Francesca

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# REP NEWSLETTER

Volume 01, No. 05

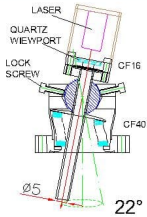
May 11, 2014



22° TILTING MAGNETIC MANIPULATOR

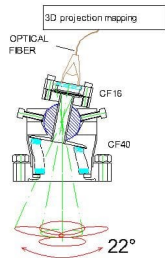
## 22° STERADIAN VIEW

Evolution of 22° steradian magnetic manipulator has produced this new steradian viewport : magnetic handle has been replaced by a quartz window and customers have developed many different research application set up.



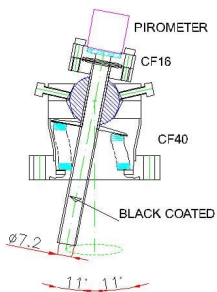
## LASER BEAM

A laser source can raster a circular area inside vacuum, or impact a beam collision center. As channel a coated tube has been inserted to avoid disturbing reflections.



## TOPOGRAPHICAL MAPS

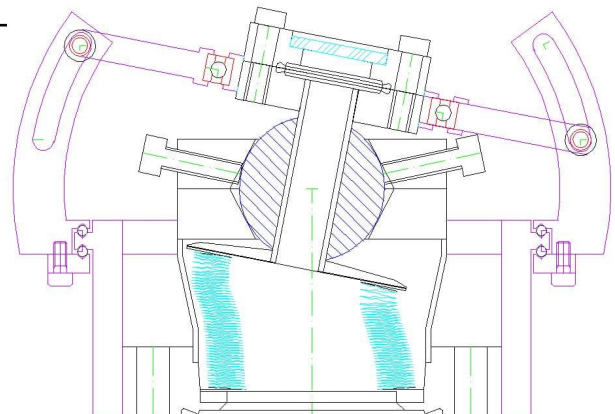
In vacuum laser scanning is now becoming a reliable and cost effective technique for topographical surveying. Reflectorless laser measurements are sufficiently accurate to meet the requirements of most survey requirements



## IN VACUUM SURFACE TEMPERATURE MAPPING

The most basic design consists of a lens to focus the infrared thermal radiation on to a detector, which converts the radiant power to an electrical signal that can be displayed in units of temperature after being compensated for ambient temperature. This configuration facilitates temperature measurement from a distance without contact with the object to be measured. As such, the infrared thermometer is useful for measuring temperature under circumstances where the thermocouples cannot be used or do not produce accurate data for a variety of reasons

## ROTATIONAL AND AZIMUTHAL DRIVEN MOVEMENTS



sponsored by : industrial application

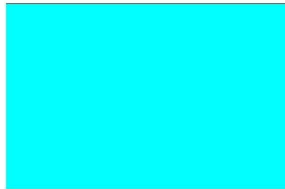


# REP NEWSLETTER

Volume 01, No. 06

June 11, 2014

## UHV BALL VALVES



Evolution of plastic materials has improved the characteristic of bake out temperature and the permeation to light gas. These new ball valve prototypes have been made with the seals in high density teflon and meldon and body in 316 stainless steel. Low outgassing, higher bakeout temperature, lower leak range allowed to reach an ultimate vacuum of  $1.10^{-10}$  mbar.



CF40 BALL VALVE -15mm INT. DIAM.

### MATERIAL

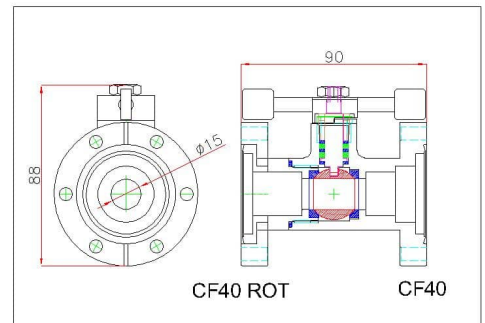
-body : 316L  
-seals : high density teflon, meldon

BAKE OUT : to 250°C

LEAK TEST : <  $1.10^{-10}$  mbar l/s Helium



- heavy-duty
- cheaper
- full conductance
- sample transfer
- beam channel
- pure gas valve



Open and closed positions of CF40 Ball Valves

sponsored by : industrial application

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# REP NEWSLETTER

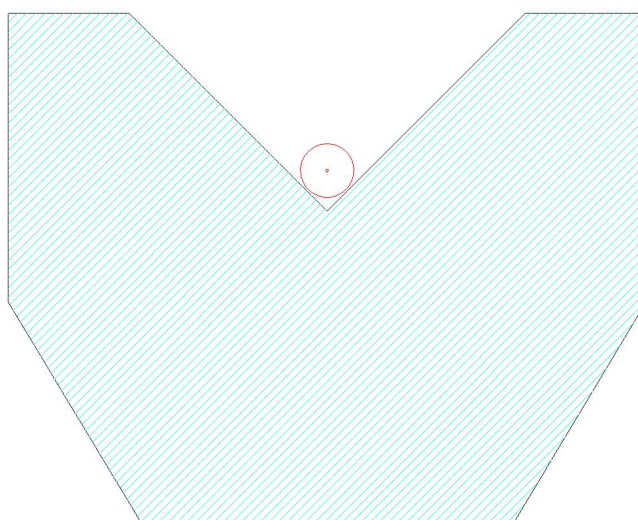
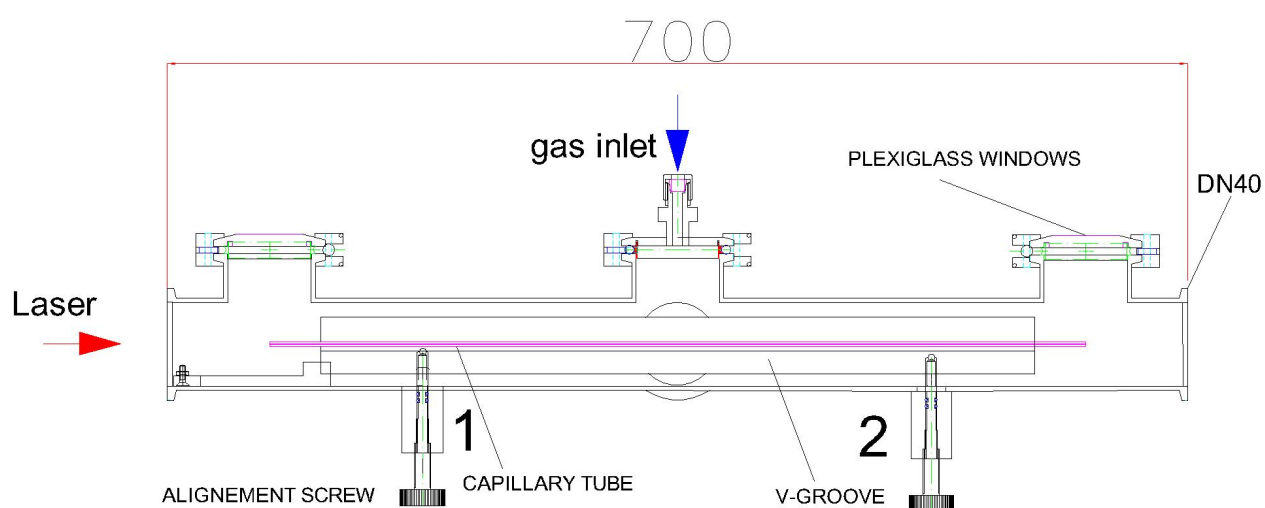
Volume 01, No. 7

July 11, 2014

## LASER MULTIPLIER



To change the length of lighth wave ,  
a capillary tube has been adopted  
with laser at 0200A



sponsored by : CNR-IFP Politecnico di Milano-Dr Matteo Negro

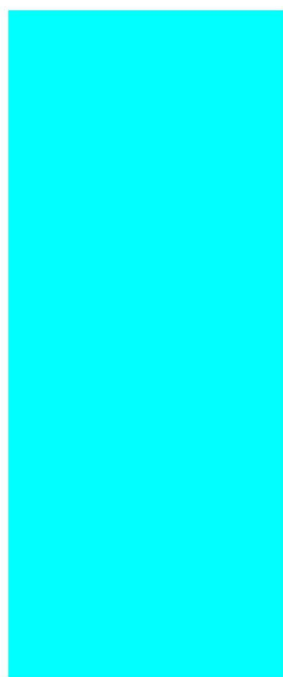
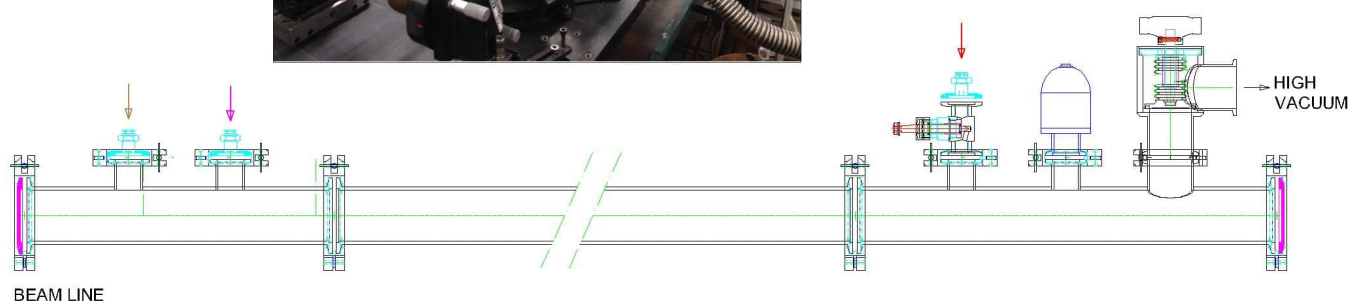
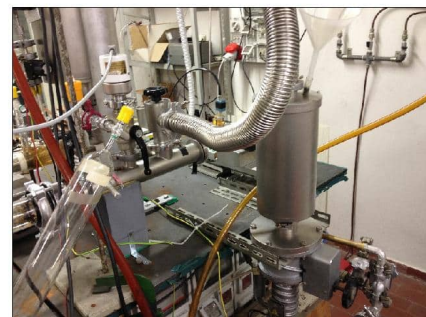
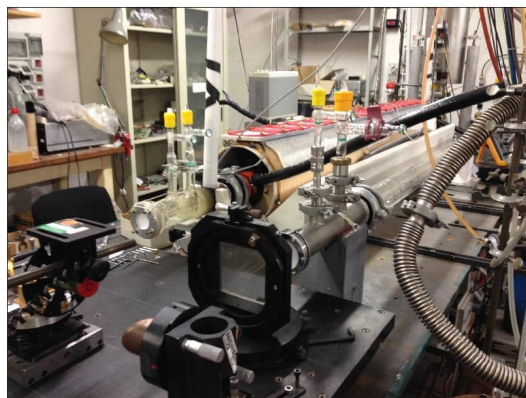


# REP NEWSLETTER

Volume 01, No. 10

Nov 05, 2014

## 1,6 THz SOURCE



A frequency modulated computer controlled spectrometer working in the 50 GHz-1.6THz frequency range has been designed for recording rotational spectra of stable chemical species at either Doppler-limited or sub-Doppler resolution. The radiation source consists of either Gun diodes or Gun-diode-driven frequency multipliers, which are phase locked to a rubidium frequency standard. Frequency modulation is achieved by sine-wave modulating the 72 MHz local oscillator of the synchronisation loop. Parabolic mirrors are used to collimate and focus the radiation into the free space cell. The latter has been designed as glass tube ( $\approx 2\text{m}$  long and 5cm in diam) connected at each end to stainless steel tubes ( $\approx 40\text{cm}$  long and 5cm in diam) equipped with gas dosing valves. One of the stainless steel tube is also connected to the pumping system: a precise and accurate regulation of either the pressure inside the cell or a gas flow through the cell is essential for successful experiments. To give an example, the present equipment permits to have a gas pressure as low as 0.15mTorr stable for hours, thus allowing us to increase the spectral resolution. The spectrometer is equipped with a liquid-He cooled InSb detector, and with Schottky detectors for frequency below 500 GHz.

*Sponsored by :*

*Chemistry Dpt-Bologna University-Prof. Cristina Puzzarini-Prof. Gabriele Cazzoli*

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