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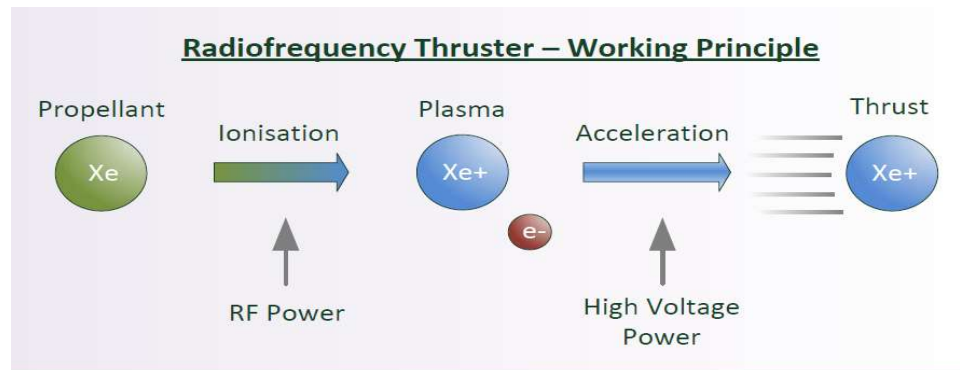
# RIT- $\mu$ X RF ION THRUSTER AND SYSTEM

Final Presentation

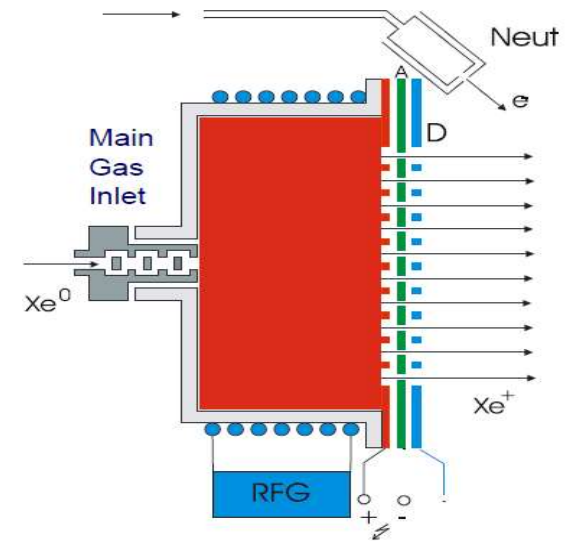
26 January 2023, ESTEC

# TASK 1: SYSTEM DEFINITION REQUIREMENT REVIEW

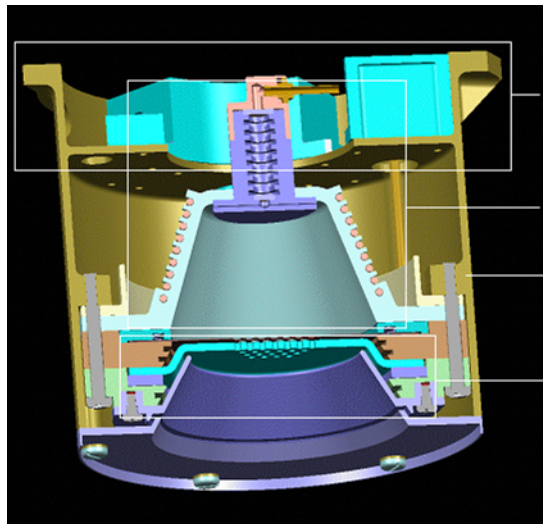
## Intro: RIT Technology



- Scalable!
- High efficiency
- Inherent high voltage insulation
- Simple and robust system design
- Perfect thrust control

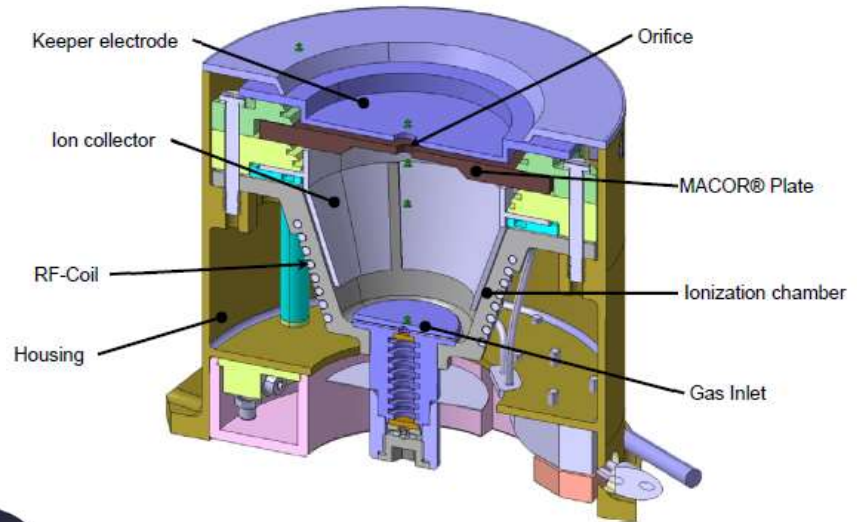


# RIT- $\mu$ X – A VERSATILE AND MODULAR DEVICE



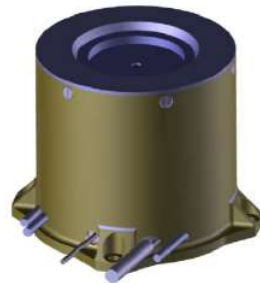
Thruster

- Interface Unit
- Ioniser Unit
- Housing
- Acceleration Unit



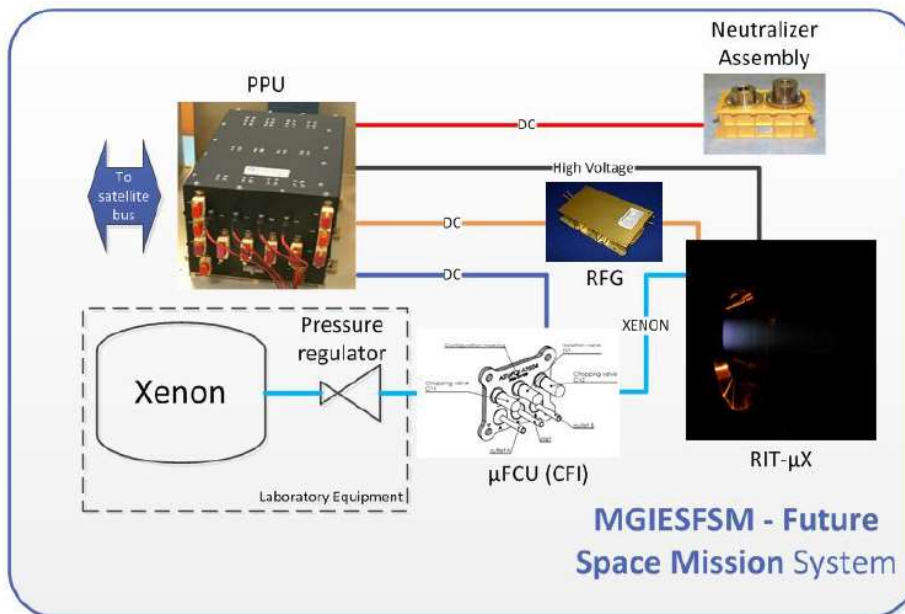
Neutralizer

- Keeper electrode
- Orifice
- Ion collector
- MACOR® Plate
- RF-Coil
- Ionization chamber
- Housing
- Gas Inlet



# RIT- $\mu$ X EMBEDDED IN A SYSTEM

## Intro: Classic System

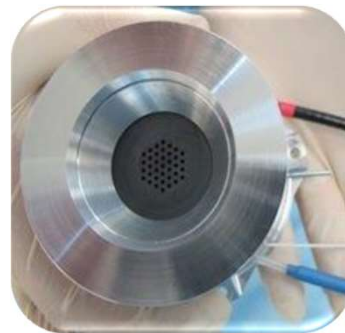


## RIT- $\mu$ X was successfully tested in full system configurations:

- PPU derived from LISA Pathfinder Indium FEED
- Thermionic neutralizer from Microscope/Lisa Pathfinder
- Radio Frequency Generator (RFG) EM
- FCU:
  - Flow Restrictors (NanoSpace)
  - Chopper System (AST); Initial test
  - MEMS Based (NanoSpace); Initial test

# RF-PRINCIPLE AND RF-SYSTEM

Concept:  
One standart  
Thruster body



Adapted Grid  
System



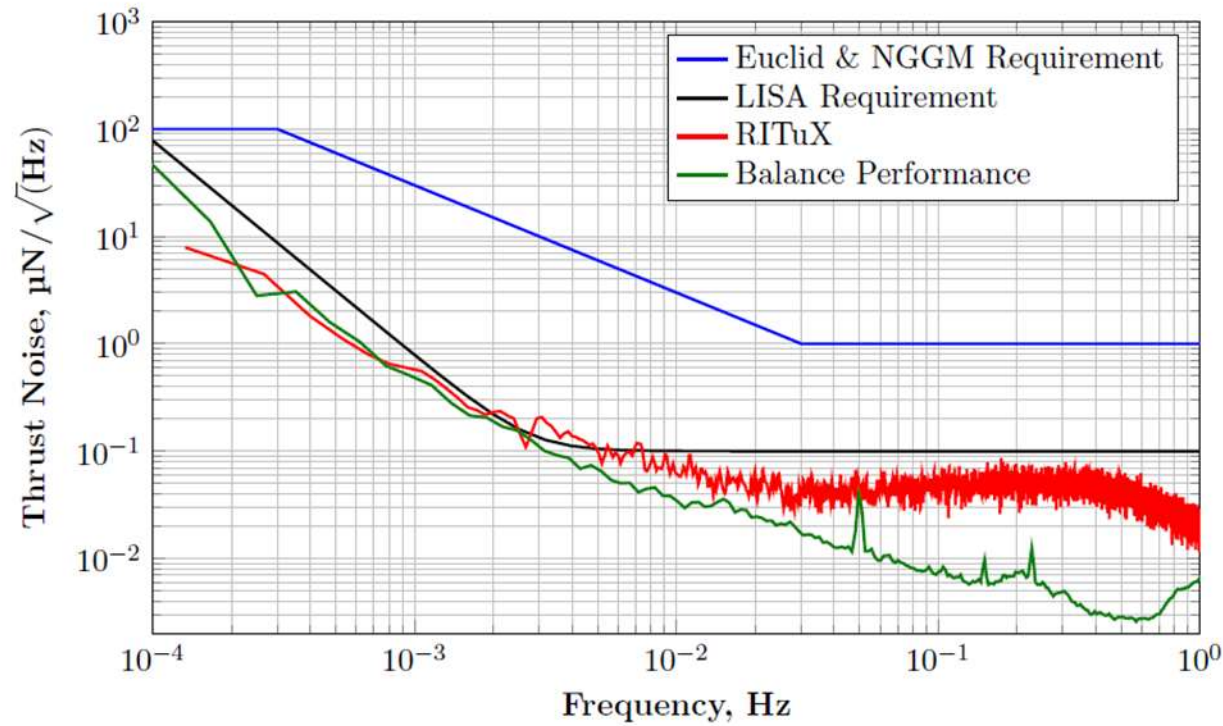
# RF-PRINCIPLE AND RF-SYSTEM

## System Configurations:

Ref	Thrust Range	Max Current	Ion	System Level Test		
				Thruster	FCU	PPU
#1	10-100µN	2mA	Yes	Yes (Flow restrictors)	Yes	Yes (Thermionic)
#2	50-500µN	7mA	Yes	MFC	Laboratory. Supplies	Filament
#3	75-2000µN	30mA	Yes	MFC	Yes	Yes (Thermionic) (RF-neutralizer)

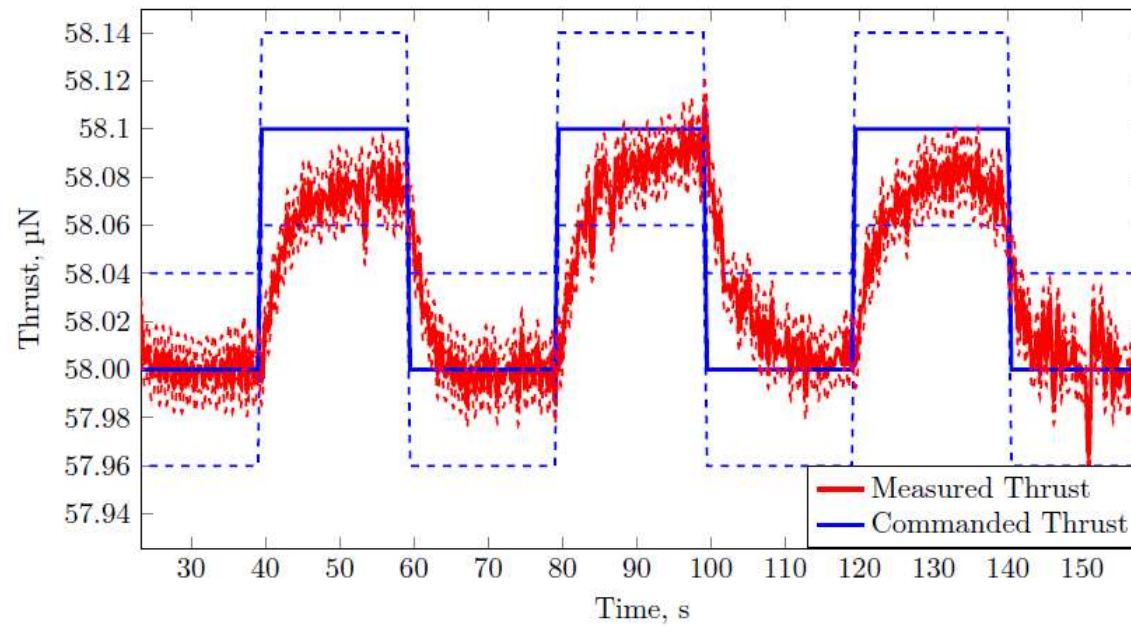


# DIRECT THRUST MEASUREMENT



Test performed at the  
Laboratory for Enabling  
Technologies – LET  
Airbus Defense and Space,  
Friedrichshafen, Germany

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## **NEXT STEPS**

### **(1) Operation with Krypton**

- Important for complete RIT Family
- Element for Erosion Model Validation

### **(2) Operation with FCU**

- Thruster performance strongly depending on FCU and PPU!

### **(3) Neutralizer for Small Ion Engines**

- Downscale of AGG Neutralizer
- Second European Source

### **(4) Contemporary PPU**

- Overcome obsolescence
- Improve performance
- Reduce mass