



ISRS Collaboration meeting

Video conference – 5 July 2023

Straight solenoids and cryostats (I)

Ismael Martel

University of Huelva, Spain



MINISTERIO
DE CIENCIA
E INNOVACIÓN



Plan de
Recuperación,
Transformación
y Resiliencia



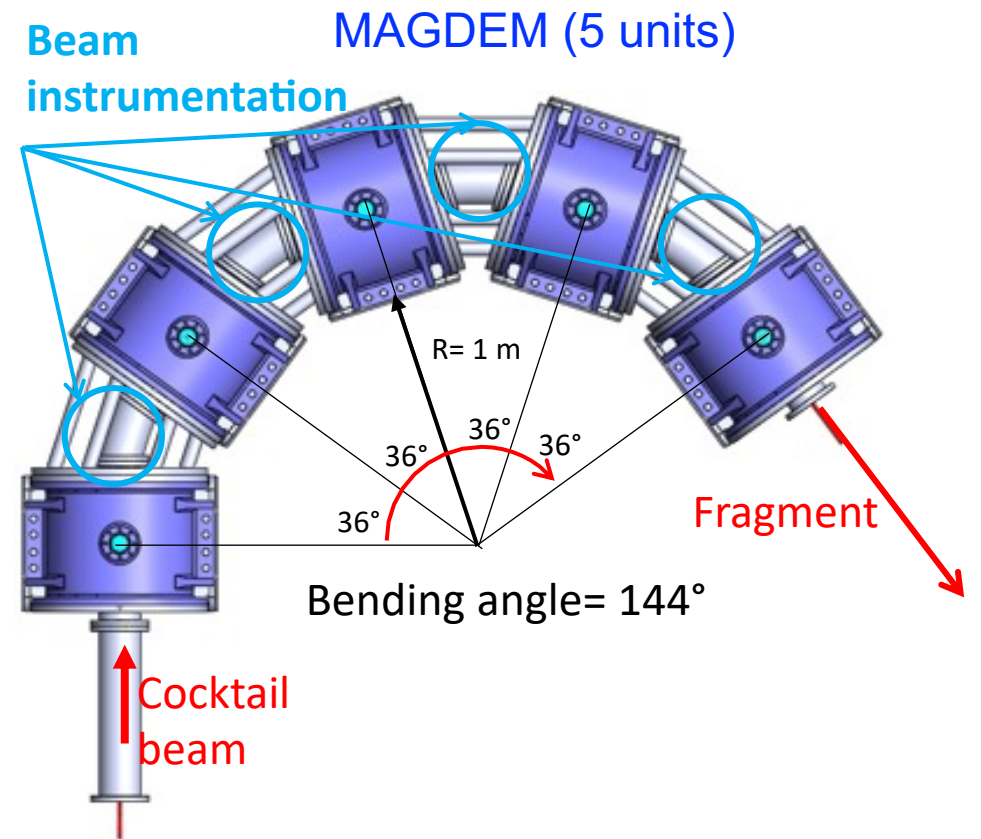
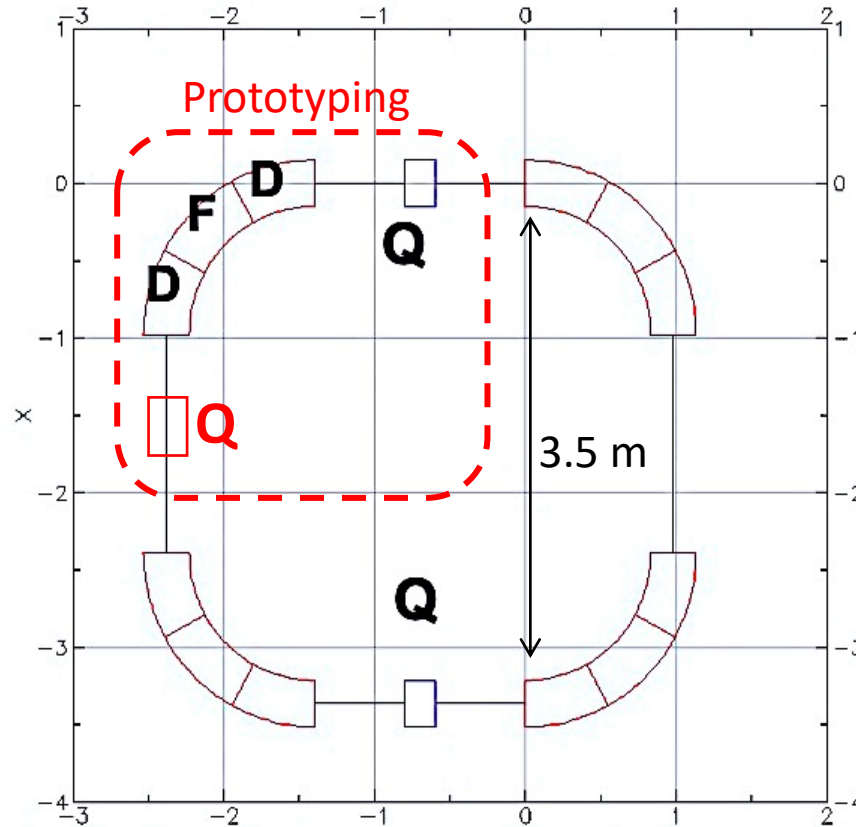
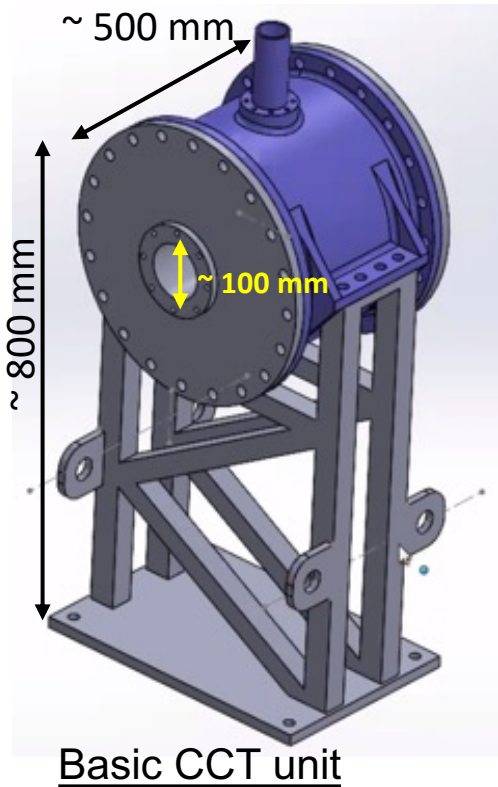
Financiado por
la Unión Europea
NextGenerationEU



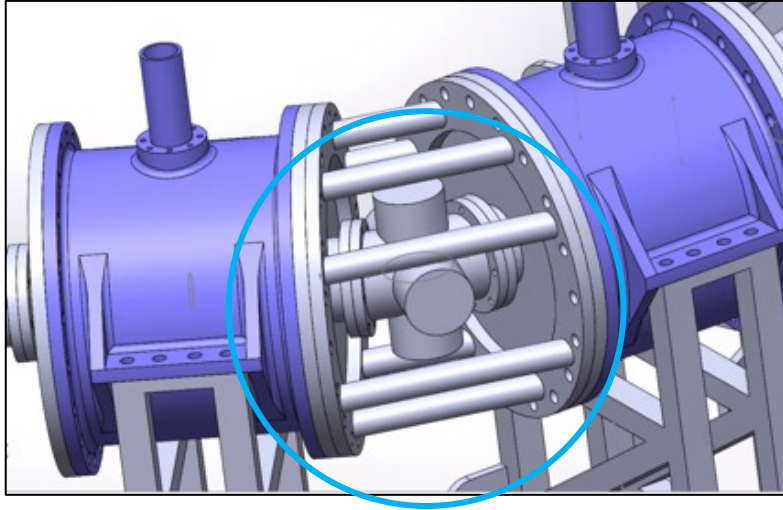
ISOLDE

MAGDEM PROTOTYPE

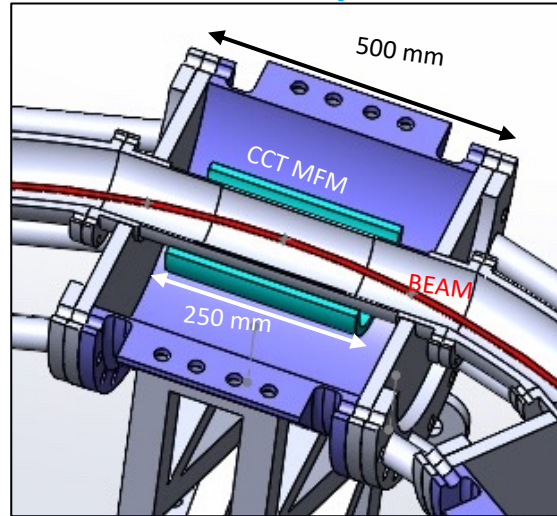
- Combination of straight CCTs (as in NIM A969 (2020))
- Cryocooler cooling
- Multifunction solenoids: dipole + quadrupole (sextuples)
- Aluminium former ~ 10-15 cm (bore) x 25-45 cm (length)
- Field specifications similar to 90° single unit model FUSILLO
- Passive SC magnetic shield (NbTi/Nb/Cu alloy, Barna et al.)
- R&D Project (2025) → deliver MAGDEM prototype elements
 - Ready for experiments → [along 2026](#)
 - Test the ISRS working concept
 - Obtain data to validate beam dynamics
 - Operate as spectrometer for light masses (reconfig?)



Beam instrumentation



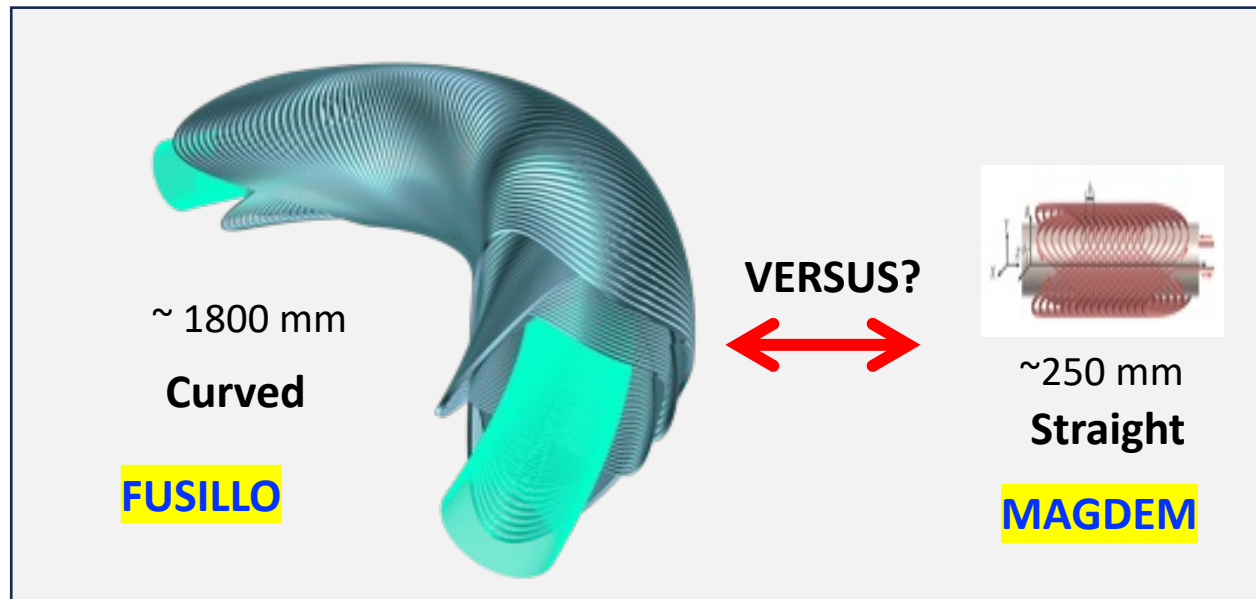
Concept



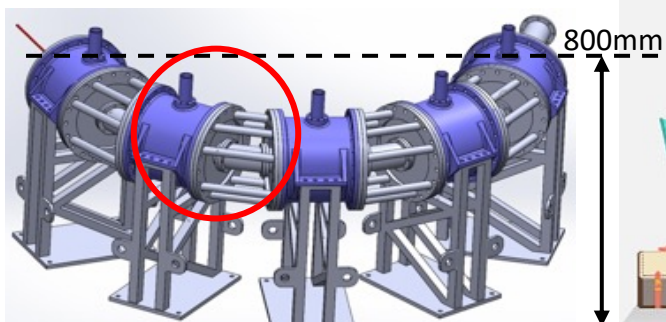
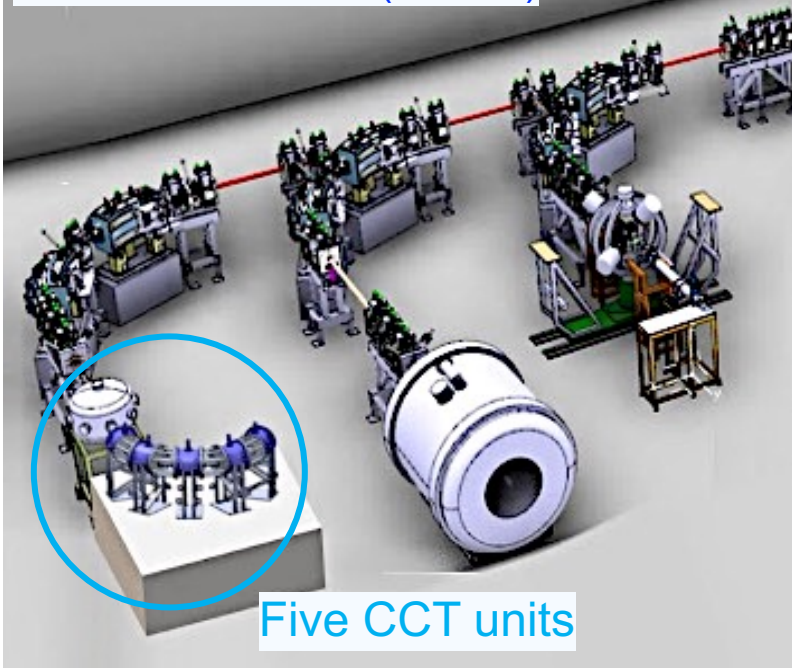
- **FIELD MEASUREMENT SYSTEM**
 - ✓ Cockcroft, Daresbury
- **CRYOSTATS, SOLENOIDS**
 - ✓ APC Paris, CERN, INFN,...
- **COMPANIES**
 - ✓ Design activities: Solenoid, Cryostat, MAGDEM
 - ✓ Construction of prototypes
- **INTEGRATION & ANCILLARY EQUIPMENT**
 - ✓ Univ. Huelva
 - ✓ IEM/CSIC Madrid

- **Straight solenoid advantages? To be studied, ...**
 - ✓ Easier implementation of dipole + quad (sextupole)
 - ✓ Reduced mechanical tension at 4.5K
 - ✓ Small thermal mass → Cryocooler or mixed LHe
 - ✓ Flexibility → instrumentation, injection/extraction,...
 - ✓ Easier for industry, maintenance
 - ✓ More expensive ??

COMPLEMENTARY TO FUSILLO (CERN)



MAGDEM at XT03 (> 2026)



MAGDEM/SUBSYSTEMS

