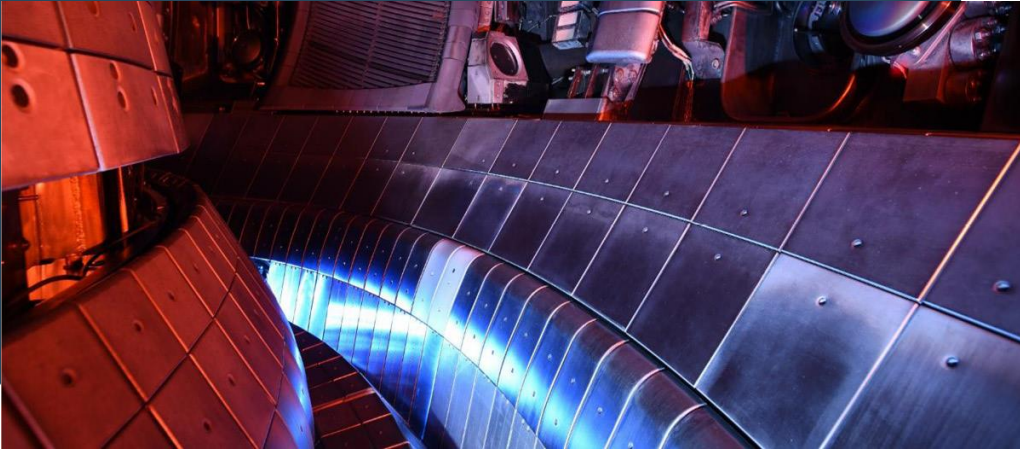




IPP

# WPPWIE SP F.1: Boronization physics and fuel retention

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EUROfusion



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# MPG Contribution to SP F.1 in 2026: Tasks and Deliverables

## Tasks to be performed (2026)

- **Exposure of witness samples on the LBO manipulator** during AUG glow discharge boronization (GDB) and samples analyzed by ion beam analysis (IBA)
- **Long-term Si samples** by IBA to determine the **campaign-integrated** spatial distribution of boron content and deuterium retention behavior

## Deliverable (2026)

- Comprehensive dataset on boron layer thickness, spatial homogeneity, erosion and redeposition behavior in AUG based on QMB, IBA witness samples and long-term silicon samples
- Benchmarking assessment comparing GDB procedures and post-boronization plasma performance between WEST and AUG

# Witness Sample Exposure during AUG GDB

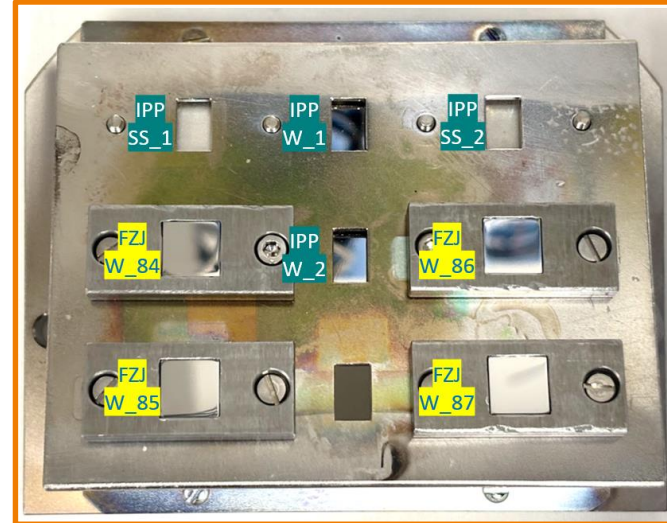
## Tasks to be performed (2026) – Task #1

Exposure of **witness samples on the LBO manipulator** during AUG glow discharge boronization (GDB) and samples analyzed by ion beam analysis

### Objectives:

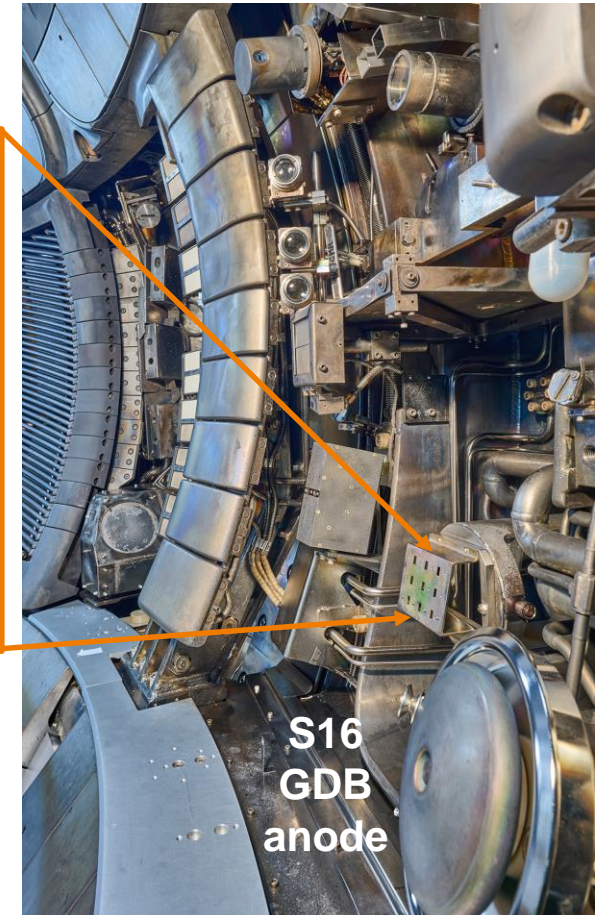
- Characterization of B and D contents in GDB layers
- Assessment lifetime of GDB layers by reference discharges **[MPG, Krieger]**
- Benchmark with lab-produced B-layer **[FZJ, Houben]**
- Measurement of CX neutrals **[MPG, Maragos]** planned in July

### LBO manipulator



### GDB on 15.06.2026:

- **MPG:** 2 × W, 2 × 316L
- **FZJ:** 4 × polished W



# Campaign-integrated B Deposition and D Retention

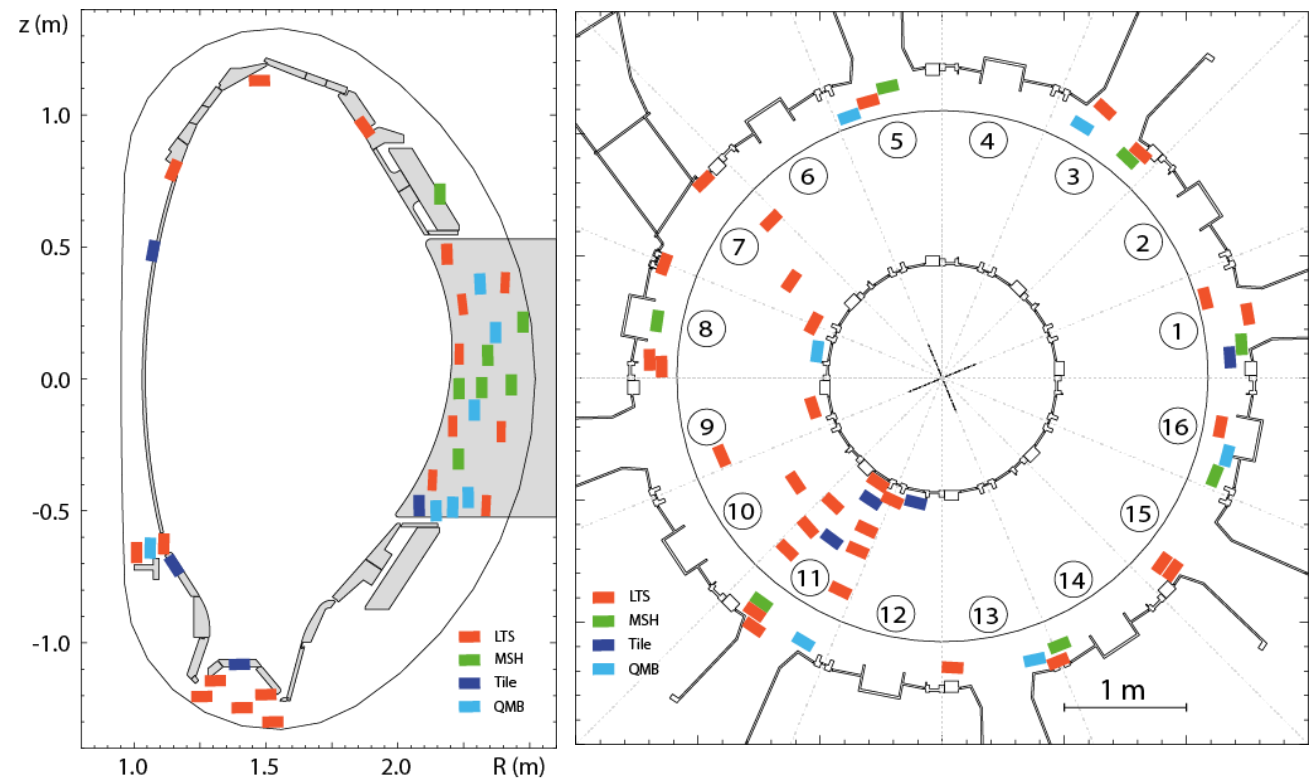
## Tasks to be performed (2026) – Task #2

**52 Long-term Si samples** by IBA to determine the **spatial distribution** of B content and D retention behavior

### Objective:

- Investigate campaign-integrated spatial variation of B accumulation and D retention
- Assess long-term erosion/redeposition behavior of GDB layers
- Provide reference data for comparison with LBO witness samples and QMB measurements

## Toroidal/Poloidal distribution of Si samples

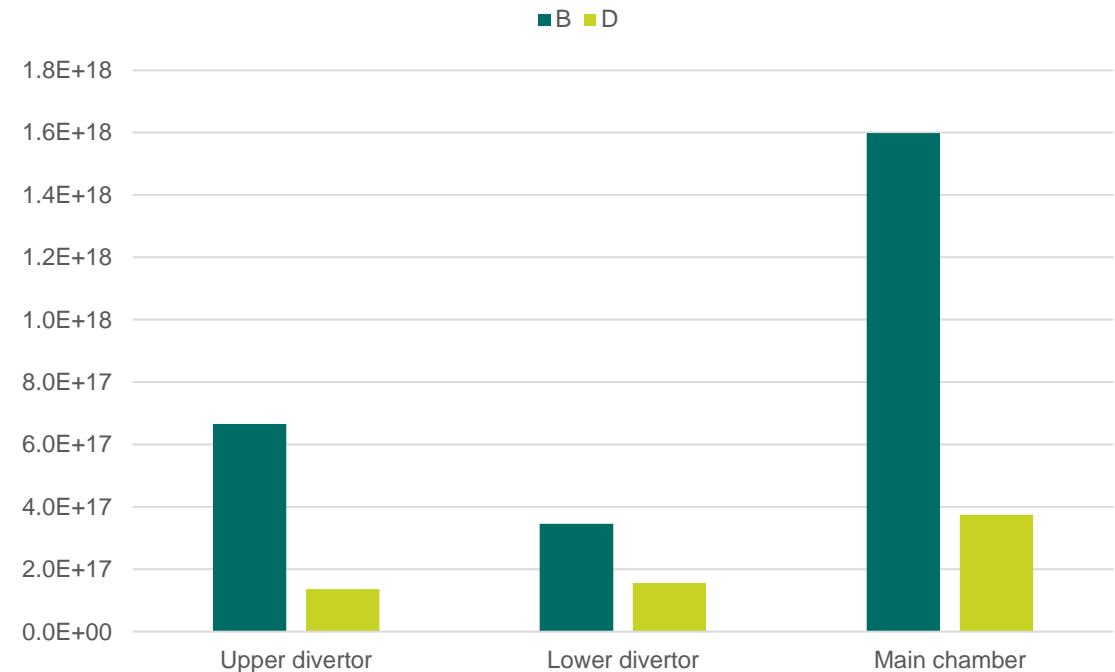
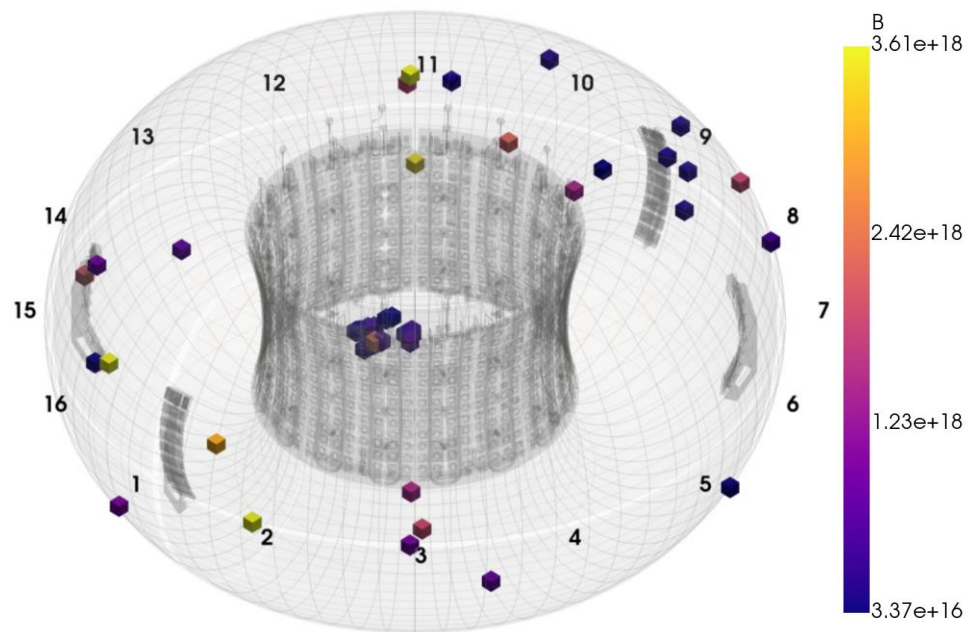


# Campaign-integrated B Deposition and D Retention

## Tasks to be performed (2026) – Task #2

**52 Long-term Si samples** by IBA to determine the **spatial distribution** of B content and D retention behavior

### NRA measurement on Si long term samples



- 52 Si wafers at varied toroidal/poloidal locations
- After campaign, samples were measured by NRA

# Expected Deliverables from MPG Activities in 2026

## D002: AUG boronization dataset

- Quantification of B layer thickness and spatial homogeneity in AUG
- Evaluation of erosion and redeposition behavior after GDB and plasma exposure
- Dataset based on QMB measurements, IBA analysis of LBO witness samples, and long-term Si samples

## D003: WEST–AUG benchmarking

- Comparison of GD boronization procedures between WEST and AUG
- Assessment of post-boronization plasma performance
- Identification of common trends and device-specific differences relevant for ITER boronization studies

**Planned dissemination:** PSI invited presentation, proceedings paper, EPS oral presentation, and based on AUG GDB sample analysis and WEST–AUG benchmarking.