**Purpose**
- Material eroded from the ITER main chamber wall near the secondary separatrix may redeposit locally along with tritium.
- Codeposited tritium will be more difficult to remove from the main chamber than from the divertor (lower maximum temperature and not designed for replacement).
- This experiment shows where material entering the SOL near the secondary OSP is deposited for an unbalanced double-null plasma configuration as planned for ITER.
- Removal of deposited deuterium/carbon by in-situ baking in oxygen is also examined.

**Experiment**
- Examine carbon deposition from plasma-wall interaction at the secondary separatrix with biased double null plasmas, with \(n_e=1\times10^{19} \text{m}^{-3}\) and \(T_e=10 \text{eV}\) comparable to conditions projected for the secondary separatrix in ITER.
- Inject \(^{13}\text{C}_2\text{H}_6\) (800 Torr-liters) through the lower outer pumping plenum (toroidally symmetric) into 18 ELMy H-mode plasmas in DIII-D.
- Measure \(^{13}\text{C}\) coverage by \(^{13}\text{C}({\text{He,} p})^4\text{He}\) NRA (2.5 MeV \(^3\text{He}\)), and deuterium coverage within 7\(\mu\)m by \(^{3}\text{He}({\text{He,} p})\)He NRA (2.5 MeV \(^{3}\text{He}\)).
- 6 tiles were oxygen baked in DIII-D at 350°C for 2 hours, 10 Torr 20%O, 80% He, and re-analyzed after O-bake.

**In-situ oxygen bake**
- \(^{13}\text{C}\) & \(^{2}\text{H}\) were also measured on the edges of tiles 1 & 21.
- Quantity of \(^{13}\text{C}\) in tile gaps is very small compared to plasma-facing surfaces.

**Conclusions**
- 44% of injected \(^{13}\text{C}\) was found (assuming toroidal symmetry) mainly near secondary OSP close to the point of injection.
- This shows that most of the \(^{13}\text{C}_2\text{H}_6\) dissociated & ionized outside the secondary separatrix.
- Previous similar experiments with \(^{13}\text{C}\) injected into the top of lower single-null plasmas show deposition is mainly in the divertor.
- This indicates that material sputtered from the wall in ITER may deposit near the secondary strike points in the upper main chamber.
- Tritium accumulation by codeposition with Be may occur at this location.
- In-situ oxygen bake in DIII-D at 350°C removed 54% of deuterium and 21% of \(^{13}\text{C}\), however the efficacy may differ for Be codeposits.

**NRA Measurements of \(^{13}\text{C}\) and \(^{2}\text{H}\) before and after oxygen bake**

- Fraction removed by O-bake
- \(13\text{C}\) and \(2\text{H}\) coverage not correlated with surface roughness (contact & optical profilometry)

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