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## Fuel Inventory and Deposition in Castellated Beryllium Structures in JET

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All plasma-facing components in ITER will be castellated. A large scale test of castellated PFC is carried out at the JET tokamak which has been operated since year 2011 with the metal ITER-Like Wall (JET-ILW). This contribution is focused on the morphology of beryllium castellated limiters and upper dump plates after experimental campaigns 2011-2012 and 2013-2014. The results of obtained with a set of complementary material research methods are summarised by the following points.

- The deposition in the 0.6 mm wide grooves of castellation is “shallow”. It reaches 1-4 mm into the 12 mm deep gap.
- Deuterium concentrations are small (maximum  $4 \times 10^{18}$  cm<sup>-2</sup>). The estimated total amount of deuterium in all castellated limiters is around  $9 \times 10^{21}$  corresponding to less than 10% of the inventory on plasma-facing surfaces of limiters.
- There are only traces of Ni, Cr and Fe deposited in the castellation gaps. The same applies to the carbon content.
- On plasma-facing surfaces X-ray diffraction has clearly shown two distinct composition patterns: Be-W mixed intermetallic compounds (e.g. Be<sub>22</sub>W) on the sides of limiters (deposition zone), whilst only pure Be is detected in the erosion zone. The lack of compound formation in the erosion zone indicates that no distinct changes in thermo-mechanical properties of Be PFC might be expected.

All data consistently show only small amounts of fuel and other elements (especially carbon) in the gaps. The results agree also with the earlier data on analyses of the castellated Be structures used in JET-C when different gap width was used.

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