**WG E1**

Matter injection and control topics has been discussed in working group E1. Four talk about specific sub-systems under the Enhancements program co-funded by Euro-fusion and F4E have been presented by the respective project leaders (Pellet, Massive Gas Injection, Divertor Cryo-pumping and Preparation of the Tungsten-PFC phase) updating about the status of the projects. One talk was given by F4E representative about the main items and challenges in the phase 2 of the Broader Approach agreement.

Main techninal points coming out:

Pellet. Constraints to design the pellet system with maximum frequency of injection of100Hz and sub-multiples; further activity on modelling about the effect on plasma of the pellet injection with the given characteristics.

Cryopumping. Detailed design in finalization and procurement starting. System specifications allow the plasma operations in Helium and regular use of the Massive Gas Injection.

Massive Gas Injection. Design finalized, parts of the system under test before final assembly and obtaining authorization for safety of the local authorities. Further clarifications suggested about the use of the system under the central control system for machine protection.

W-PFC. Significant evolution of the W-PFCs technologies available for JT-60sa were reported. Boundary conditions for the project to be clarified from physics (power loads/erosion rates) and organization (resources/schedule) point of views. Sinergy with Euro-fusion and DEMO divertor programs. F4E announced the plan to develop and build a new non-monoblock divertor tile concept relevant for JT-60SA and also DEMO.