**TG Edge&Divertor**

**Subgroup Fueling & Exhaust**

**He exhaust proposal discussion**

**16.02.2022 from 1601 to 1720**

**Attendees:**

Thierry, Stepan, Thilo, Victoria, Dieter, Dirk, Kenneth, Felix, CP

**Meeting objective:**

Give an overview of the available gas fueling and exhaust systems as well as neutral gas diagnostics. Discuss contributions by UW Madison from Stepan and by the impurity team from Victoria.

**Available neutral gas systems:**

Victoria mentioned the limited distance of FZJ-GAS2 towards the LCFS and that it can’t be moved too close due to heat loads.

CP shared some images of the tungsten coated heat shield. Roughly 100 tiles in module 1 and 5 on the LFS of the heat shield are coated with tungsten.

Dirk would like to have the NBI and pellet system included in the diagnostic overview. As of right now the blower gun will not go online, and only the steady state pellet injector will go into operation mid OP2.1.CX spectroscopy should also be included.

4 lines and therefore partial pressure measurements of 4 gas species can be observed by the WISP gauges. Besides H and He, Felix voiced the desire to include Neon and Nitrogen, or Argon. Concerns about cross talk for possible lines for these impurities was voiced.

**Stepan for UW Madison:**

A large overview of topics was presented, see slides on indico and x-drive.

Ken would like to see a prioritization of selected topics and voiced questions on how the He enrichment is quantified.

Felix was wondering where the connection between IRC vs ERC in regards to He retention in the SOL? What is good enough?

What are the spectroscopic ways to resolve density?

Felix proposed the idea to keep F\_rad constant at different impurity concentrations.

Dirk would like to see a more detailed proposal overview with individual proposals and the specific methods listed.

Dirk would like to start a discussion on how the divertor plugging could be increased. Can we change the islands in a way to get hot plasma to the targets poloidaly so that neutrals are less likely to escape?

Felix pointed out that the dominant He neutral source will be the recycling on the strike line, and therefore the puff location will be less relevant.

CP brought to attention that we will try out Ar frosting of the cryo pumps but lowered expectations and that this process is highly experimental.

**Victoria, Felix, Thilo on He transport:**

The previous discussion went longer than expected and there wasn’t much time for discussion. Victoria briefly went over their well prepared proposals and how multiple proposals can be tackled with the same set of discharges.

A short discussion was had about the modulation frequency and if this would allow for tau\_p\* measurements.

Dirk would like to see some modeling of the plasma response towards the He puff modulation, but Felix had concerns about the informative value of such modeling.

**Action items:**

All:

How can we increase divertor plugging?

Stepan:

Work on more detailed proposals with diagnostics and discharges in mind.

How is good He retention defined? How is it measured?

Thierry & Georg:

Work on and extend a concise overview of neutral gas systems relevant to the group.

Next meeting is as scheduled on March 2nd. We will continue to discuss the He transport proposals by Victoria, Thilo and Felix. If time is left Thierry will present ideas for a combined experiment on core confinement time measurements and S/XB for He.