HIE-EBIS workshop summary

CERN, 16-17.10.2012

Foreword

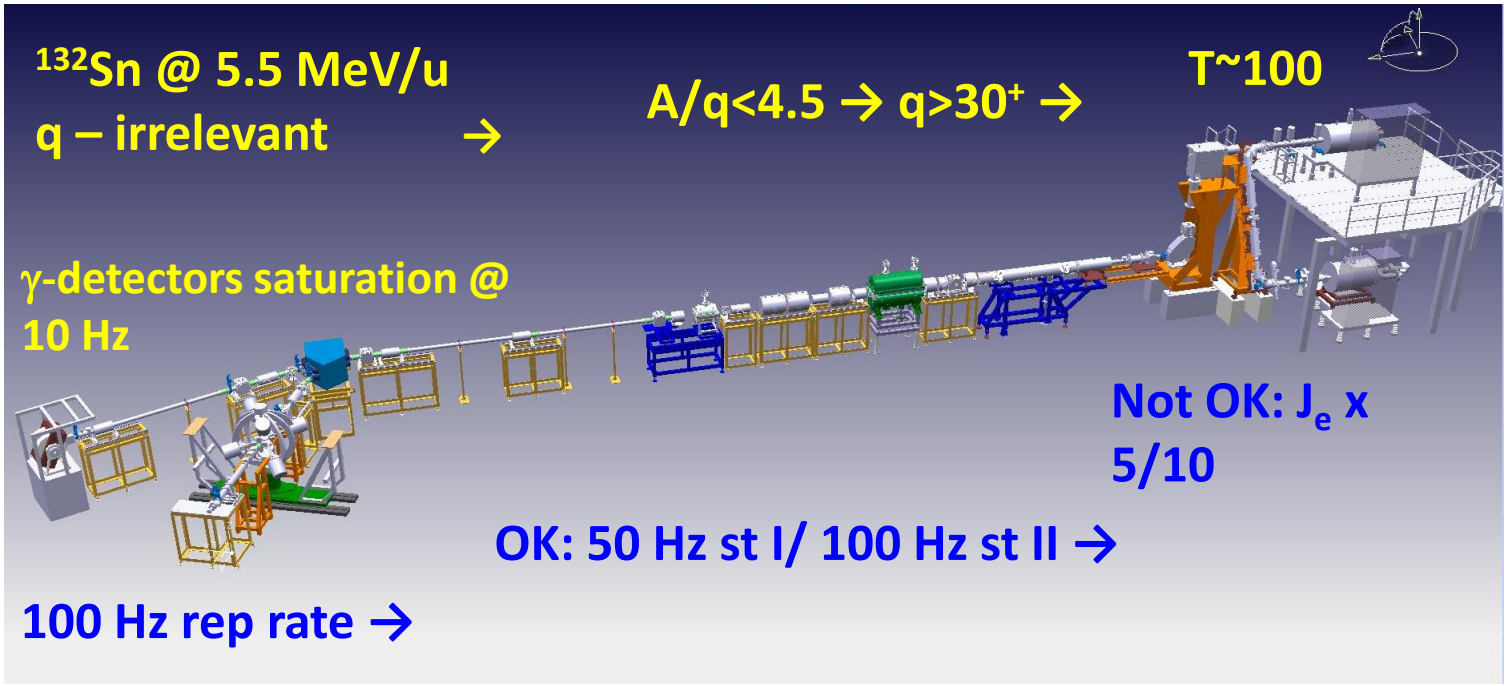
Thanks to all the visiting and CERN-internal participants for attending the workshop and sharing your knowledge.

We all learned more about the pie and the emittance

The important things we have learned

1. The electron beam

The priority number one for us is to get the beam parameters close to specified



The important things we have learned

1. The electron beam

We find the BNL high density gun project interesting to our application and would like to contribute in its development and test

The important things we have learned

2. Ion-ion cooling

The ion-ion cooling confirmed to be crucial for the HIE-EBIS application at high ionization factors

Due to chosen separate vacuum concept we would prefer options with the neutral gas injection outside of the main trapping region.

The option of externally generated 1+ cooling ions found less favourable

The important things we have learned

3. Vacuum requirements

The vacuum requirements were found to have the most of the points to be verified on different levels.

The important things we have learned

3. Vacuum requirements. Level 0.

Current requirements to vacuum in HIE-EBIS are based on CBSIM simulations Taking into account CX process.

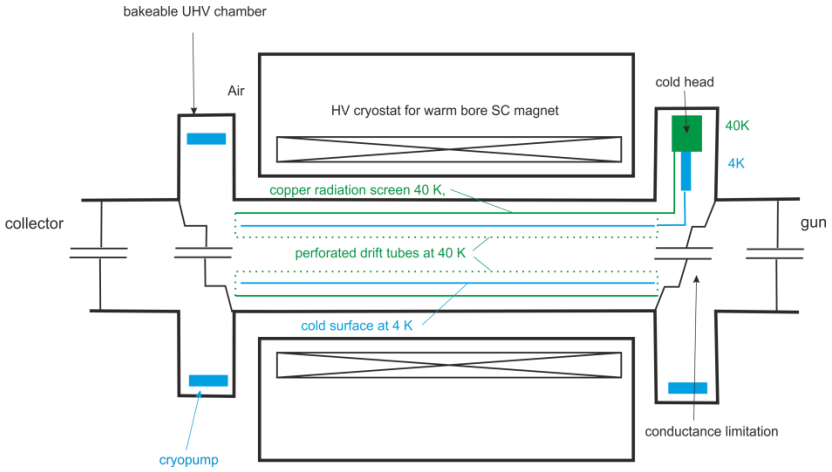
These relay on extrapolation of low charge state CX cross-section to higher states which is questionable and not entirely supported by experiments on VHCI

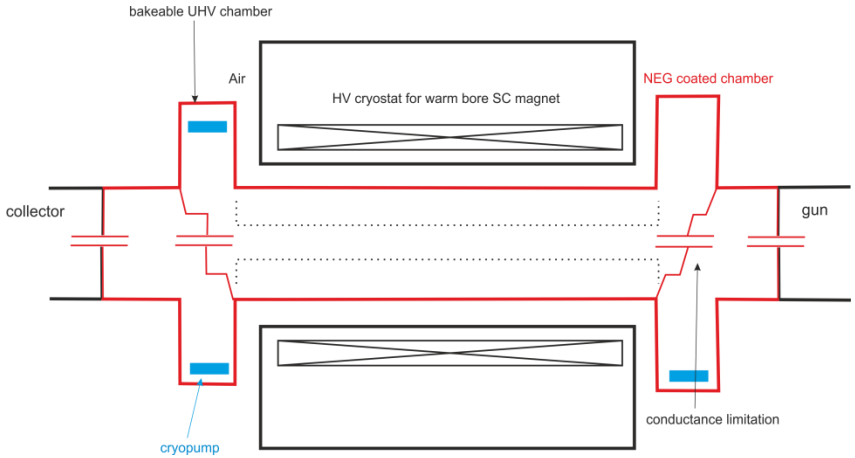
The results of CBSIM regarding CX will be double checked with other simulation packages (one by Yaming Zou + other mentioned) and experimental data to refine the vacuum requirements regarding CX.

The important things we have learned

3. Vacuum requirements. Level 1.

Basic concept. The final choice of NEG-dominated and Cryo-dominated pumping To be chosen based on tests with the electron beam regarding RF and potential losses to the drift tubes.





The important things we have learned

3. Vacuum requirements

Level 2. Specific use of technologies.

Thermally floating NEG covered surfaces found questionable in their ability to assist pumping in the trapping region. Electrically heated strips can be made rather compact

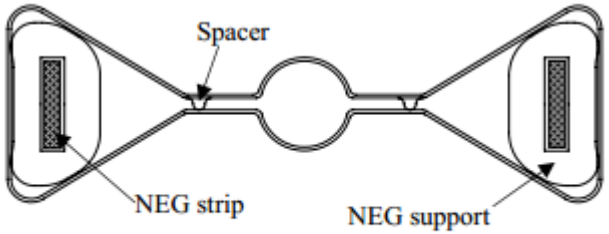


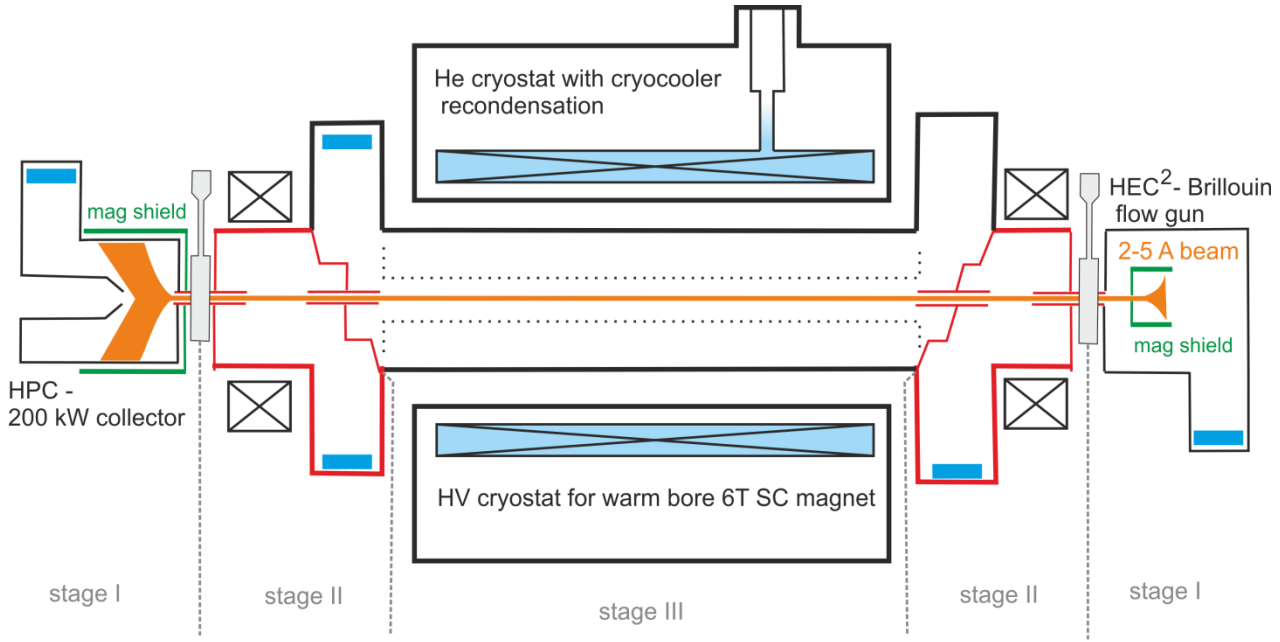
Figure 1: Concept of the vacuum chamber

The important things we have learned

3. Vacuum requirements

Level 2. Specific use of technologies.

NEGs are still good option for differential pumping chambers.



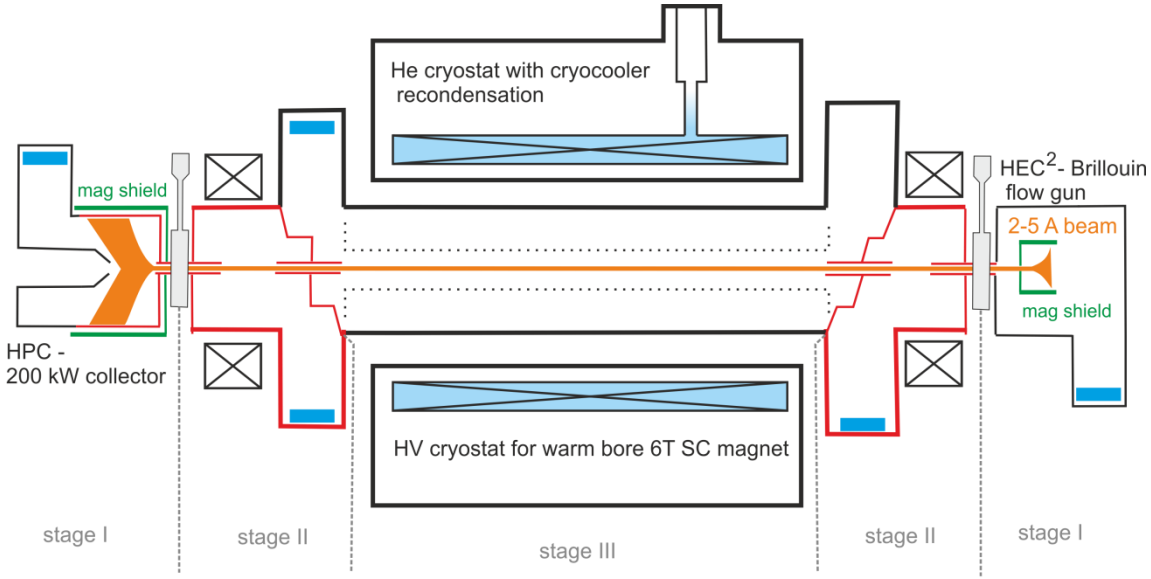
3 stages, separable, high differential,distributed pumping system with redundance

The important things we have learned

3. Vacuum requirements

Level 2. Specific use of technologies.

NEG coating of the collector absorbing surface regarding ESD to be verified regarding the coating stability under massive electron bombardment and prolonged elevated temperatures.



3 stages, separable, high differential,distributed pumping system with redundance

A bit collaboration options

The HIE-ISOLDE design study group leader Richard Catherall will brief you into the available collaboration options in the framework of HIE-ISOLDE project.