**H4F Workshop follow-up 2016: Experiment and accelerators**

HADES:

* Pointing stability – the beam moves over the target, changes in the extraction parameter as there is not the HADES info available
requirements of a feedback system
* At FRS angle and momentum drift has been observed
* Beam abort system for SIS18
* Micro-spill structure reduces the use of the ions by a factor of 3

R3B:

* Medium slow extraction 100-200 ms for DESPEC
* 10-10^6 Hz for R3B
* Here as well at high event rates a better spill structure could reduce the beams time by a factor of 3 (for beam rates >100 Hz)
* Low intensities, 1 kHz over 100 ms possible

Slow extraction:

* Sextupole resonance extraction, quad driven 🡪 change of separatrix, change of extraction angle
RF knock-out 🡪 particle excitation, constant extraction angle possible
* Beam losses due to magnet ripple
* Possible solutions (betatron core)

SIS18:

* Extraction efficiency 🡪 precision determination of e-septum position
Position accurate by 1 mm of the magnetic septum
E-septum 🡪 wrong angle compared to separatrix angle!
* Collimator retracted
* Machine experiment in 2016 – ripple and spill structure coincidence measurements
* Emittance determination of extracted beam foreseen
* No single ripple frequency identified 🡪 feedback already tried in the 90th
* Stochastic extraction 🡪 ripple mitigation
* Simulation of a patchy distribution of particles?

HEST:

* Scintillator screens are a benefit for beam tuning
* Transfer of beam from ESR to CRYRING at 4 MeV/u
* Larger aperture in quads in front of the pion-target, space for the beam in transport line 🡪 losses due to halo particles
* Beam diagnostics is main issue, BLM are required
* Beam matching from FRS to ESR does not fit. Diagnostic (SEM grid) required.
* Halo collimation downstream/in SIS18

Ion sources:

* Improvement of the MUCIS, better plasma confinement with stronger magnets, new filament position
* New post acceleration gap, closer to the source, better transmission
* There is a structure in the beam extracted from the MUCIS
* For higher intensity p-beams, stripping of Hydrocarbonites
* MEVVA, high charge states are an issue due to high vapor pressure for material with low melting point
* For Au around 6 mA 250 micro sec, 2 Hz for Bi, no intensity
* U operation via UW combination, 2 Hz is problematic
* 9Be is very toxic, therefore difficult approval process, Pu, 235U
* Less intensity, better emittance?

UNILAC:

* MEBT beam matching with present RFQ output not possible
* 100% transmission with new MEBT design using a buncher and triplet lenses
* Upgrade as planned is required (up to ALVAREZ)
* Alvarez substitution – scenarios in MAC15, robust design with alternating stems
* IH solution with short structures and triplet focusing

Beam dumps:

* Material choice for beam dumps to cover the thermal stress
* Invar and Inconel as choice
* SIS100 dumps, injection and extraction (large size), ANSYS simulations required, cooperation with CERN
* Radiation damage 🡪 change of thermal properties

Charge state stripper:

* Proposal for a SPARC thin foil stripper, fast retractable in 100ms via linear drive. Industry solutions available
* SIS18 🡪 SIS100 stripping station, if fast positioning of foils is possible
* Position of the SPARC stripper in front of the SIS100, T1S3 and T1S4, first proposals available
* Mechanical design of modified vacuum chamber required