

Overview of the activities in WP “SIS100 Beam Dynamics”, May 2016

	Subtopic	Responsibility	Collaboration	Remarks
2	Codes			
2.1	Impedance Simulations, Measurements	Boine-F, Niedermayer (TU)	HV	FEM-based library for impedance simulations
2.2	Code Development	Boine-F		Further development. 3D: PATRIC, PyORBIT. 1D: BLonD. MADX with space charge. New methods for accelerator optimization (generic algorithms)
3	Incoherent Effects			
3.1	Slow Extraction	Sorge	System Plann.	With space-charge, field errors. Stability and effects of CO. Sensitivity to the machine and hardware settings.
3.2	Magnet Field Data, Magnet Sorting.	Kornilov Sorge Franchetti	SC Magnets	Transfer and analysis of the measured magnetic data from the SIS100 magnets. Dynamic Aperture calculations. Sorting: the concept, input for magnet measurements.
3.3	Gradient Errors. Compensation.	Chetvertkova Franchetti	System Plann.	Beta-Beating and the beam losses, high-intensity effects.
3.4	Resonances & High Intensity	Franchetti + PhD	SC Magnets	High-intensity dual harmonic RF operation. Beam loss and beam quality: transverse emittance after accumulation/ramp. Resonance compensation.

4	Collective Dynamics			
4.1	Bunch Compression 3D	Appel + PhD (Y.Yuan)	RF	With PyORBIT. Requirements for the barrier bucket pre-compression.
4.2	Collective Instabilities: Predictions. Impedance budgeted.	Kornilov	HV, System Plann.	Instabilities in the bunches with space-charge, dual-rf. Proton cycles: low, high γ_r , stability around/above transition. Analysis of the impedances from 2.1
4.3	Collective Instabilities: Cures.	Kornilov + PhD (Karpov)	HV, System Plann.	TFS: specs, efficiency, transverse emittance. Landau Damping: octupoles, dual-rf, space charge.
4.4	RF manipulations, Longitudinal Stability	Boine-F, NN (100%)	RF, System Plann.	Various RF gymnastics with space-charge, beam loading. Cavity specs. Microwave instability in proton bunches for low slip factor, longitudinal BTF.
4.5	Transition Crossing/Jump 3D	NN	RF, System Plann.	Detailed gamma-t, rf phase, rf voltage, chromaticity schemes. SC mismatch, transv. space-charge, 3D emittance. The role of the longitudinal and transverse feedback.