MuCol WP 6.1 Meeting Notes (10th meeting) – 29/07/2024, https://indico.cern.ch/event/1441763/, via Zoom

Participants:

CERN: Alexej Grudiev, Leonard Thiele, Simon Albright, Carmelo Barbagallo, David Amorim, Elleanor Lamb, Avni Aksoy, Bernd Stechauner

Univ. Rostock: Ursula van Rienen, Simon Adrian, Sosoho-Abasi Udongwo

University of Strathclyde: Liang Zhang, Kevin Roland, Rober Kyle

FNAL : David Neuffer

Report from CERN (Avni Aksoy):
- RLA design changed from a dogbone to a racetrack
- The main challenge in the dogbone was the matching at the arcs with an asymmetric energy between the bunches (one needs to travel in front, while the following receives a lower energy kick from the induced voltage → almost impossible for optics
- In a racetrack, this problem is not present, as bunches propagate in the same direction and gain energy symmetrically
- Due to the complicated optics, the arcs were very long compared to a racetrack design
- The energy gain per pass is assumed to be lower in a racetrack configuration → more passes necessary to reach the same energy
- Rm spread at 30mm at the beginning
- Total bunch length == 200mm at injection of the beam
- Long bunch length makes low frequency necessary to preserve emittance → 350MHz LEP2 cavities are used as a baseline
- LINAC section uses FODO type lattice with fixed SC QP and two cavity modules in between, each housing 3 cavities
- Large energy spread due to low frequency → reduce with linearizer cavities at the third harmonic (1056MHz)
- Karl Bane formalism is used for the short-range wakefield → bunch not too long?
- Arcs: small momentum compaction factor and chromaticity
- should control higher order terms with second order achromat
- energy acceptance of arc very large →
- The most difficult is the design of a spreader between arcs
- spreader is also used for the matching to the arcs → roughly 100m for matching
- bypass setting in the middle of the arc
- phasing difference gets adjusted in the arcs

Round table discussions & AOB:
- Next meeting 13.12.2024, 15:00 o'clock