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# Status of the Aramis Undulator beamline

- Undulators and Phase-Shifters were all magnetically tested & calibrated in the Lab
- Models were developed and they have been implemented in the control system using the database by Didier-Chris-Arturo to predict:
  - K-value
  - Local orbit corrections
  - phase matching resonance condition
- A photon-based procedure was implemented and transfer to operation to verify:
  - K-value calibration
  - Alignment (y/pitch)
  - the Earthfield correction
  - Pointing
  - phase matching resonance condition



# Status of the Aramis Undulator beamline

- The pointing was a reliable tool (even if not very accurate) to help the operation and in particular to support the efforts towards an accurate BBA, finally demonstrated last December
- Concerning online K-value calibration, it was demonstrated during one of the last shift dedicated to this issue that this procedure can be reduced to a single K-value per undulator module:
  - a gap offset is enough to recover reliable values





### Status of the Aramis Undulator beamline

Together with Eugenio, we demonstrated the feasibility of measuring the source point (x/y) of each undulator modules within 10  $\mu$ m :

- Using two variable apertures (APU44&92) and a mono-beam
- ~1h to measure all modules , (today @ 100Hz should be even faster)





- Repeat regularly the calibration of the K-value with the "reduce" procedure (every 4-6 months?)
- Improve the feedforward table for local correctors
  - Now that we have a reliable BBA to reach the nominal orbit it should be easier
- Improve the phase shifter resonant condition?



### Athos Apple X Undulators









K-value definition





#### Photon Diagnostic for Undulators





#### Measurement of the Iron Edge





(a) Diode signal

(b) MCP signal





<sup>(</sup>a) Individual measurement traces and edge fits





(a) no filter



(b) with Fe-filter



















# Status of the Athos Undulator beamline

- 14 UE38 have been installed in the tunnel
- 15 have been magnetically tested
- 15 CHICs (all) have been magnetically tested and installed in the tunnel
- Models to predict the K in the main polarisation modes (LH, LV,C+,C-) and the local orbit corrections have been implemented using the database:
  - thanks to Didier, Arturo & Chris K
- All CHICs interpolated calibrated measurements have been implemented in the control system by Eugenio
  - Easy selection of the delay and horizontal offset
- A basic photon diagnostic has been commissioned (working only in C+/-) for
  - Pointing
  - K calibration
  - Alignment



- Cross check of the local orbit correction schema
  - in particular the sign of the correctors
- Commissioning the alignment quadrupoles
- Implement the model for predicting the phase matching resonance condition in all polarisation
- Implement elliptical and arbitrary linear polarisation
- In the second half of 2021, photon based alignment and calibration using the monochromator
- <u>One still open question</u>: shall we change the CHIC magnets with the new one to reduce the kicks or we can live with the local corrector coil?



### Thanks for your attention

