BSList 110626: First look at small VWien changes

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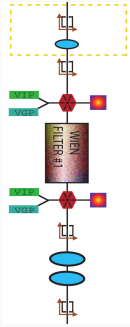

BPM	IPM1I02
CORRECTOR	MBH1I02H&V
SOLENOID	MFX1I03
BPM	IPM1I03
CORRECTOR	MBH1I03H&V
VIEWER	ITV1I03
QUAD	MQW1I03
V-WIEN MAGNET	MWF1I04
Positive HV PVs	PWF1I04P
Negative HV PVs	PWF1I04N
VIEWER	ITV1I04
QUAD	MQW1I04
BPM	IPM1I04
CORRECTOR	MBH1I04H&V
SPIN FLIPPER	MFG1I04A
SOLENOIDS	MFG1I04B
BPM	IPM1I05
CORRECTOR	MBH1I05H&V

Objective

- Polarization feedback: small changes needed
- Focus on VWien & spin-rotator solenoids
- Steering corrections & transport matrices angle-dependent
- To predict settings w/o extra setup, investigate:
  - Reproducibility / linearity of steering correction
  - Optics
  - Transmission (consequence of optics)
  - Polarization
  - PQB effects

Steering correction

- VWien at 90°, spin-rotator solenoids at 90°
- Vary both by $\pm 2°$
- VWien steering correction:
  - Needs small upstream & downstream correction, but linear with angle
  - Can measure & invert orbit response for automation
- Solenoid steering correction:
  - Unnecessary if incident orbit is aligned
  - Small correction necessary in practice, but downstream good enough

Mott measurements (HWP in/out combined)

VWien angle	Flipper angle	UD asymmetry (%)	LR asymmetry (%)
90	90	33.0(2)	−1.2(2)
90	88	33.5(2)	0.0(2)
90	92	33.0(2)	−2.6(2)

- out-of-plane rotation measurable, behaves correctly

Next steps

- Measure change in VWien transport matrix
- Map out transport matrices of spin-rotator solenoids
- Devise & test algorithm for quick orbit restoration
- PQB & transmission tests (best done with fixed solenoids)