SIS 100 Corrector Magnets

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GSI FAIR-MT

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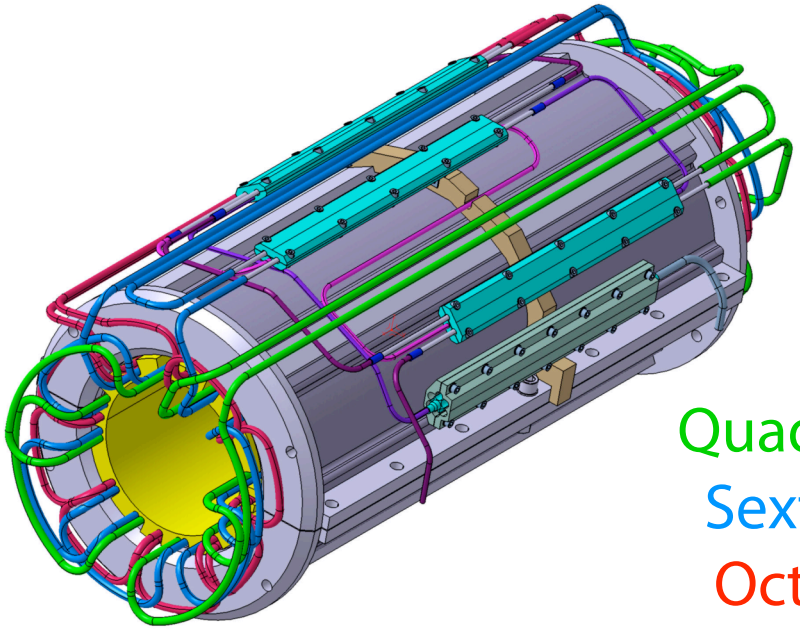
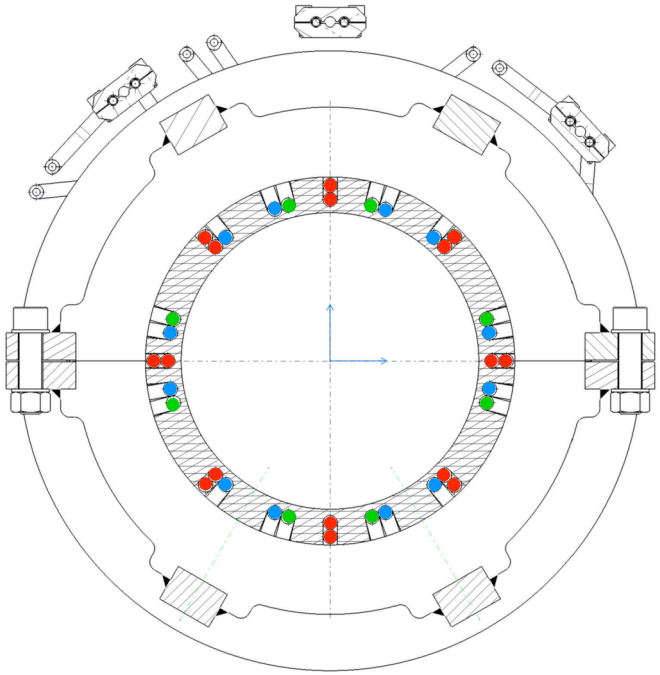
SIS 100 Corrector Magnets

- Error compensation multipole corrector
  - Quadrupole, sextupole, and octupole are nested.



Quadrupole
Sextupole
Octupole



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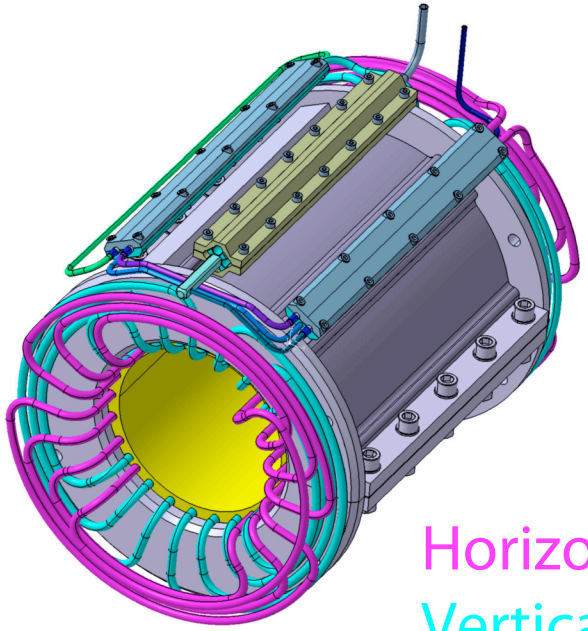
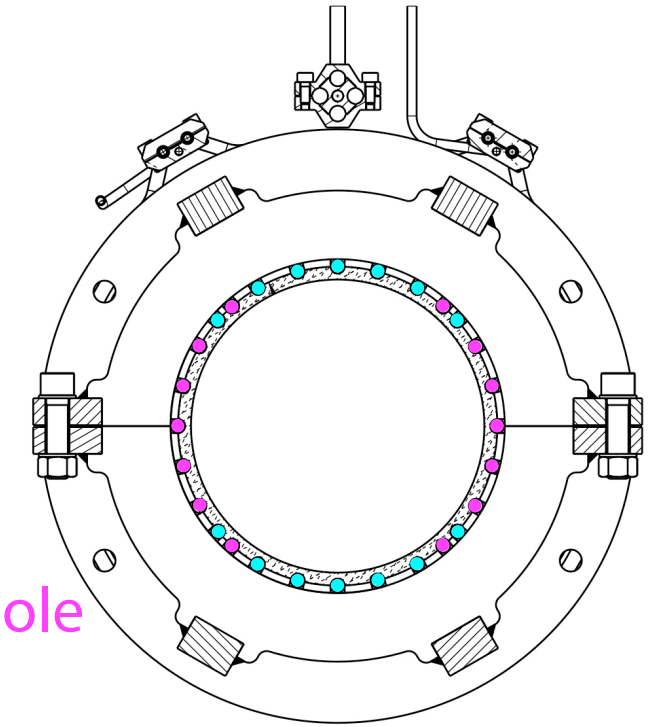
- Steerer magnet
  - Horizontal and vertical dipoles are nested.



Horizontal (normal) dipole
Vertical (skew) dipole



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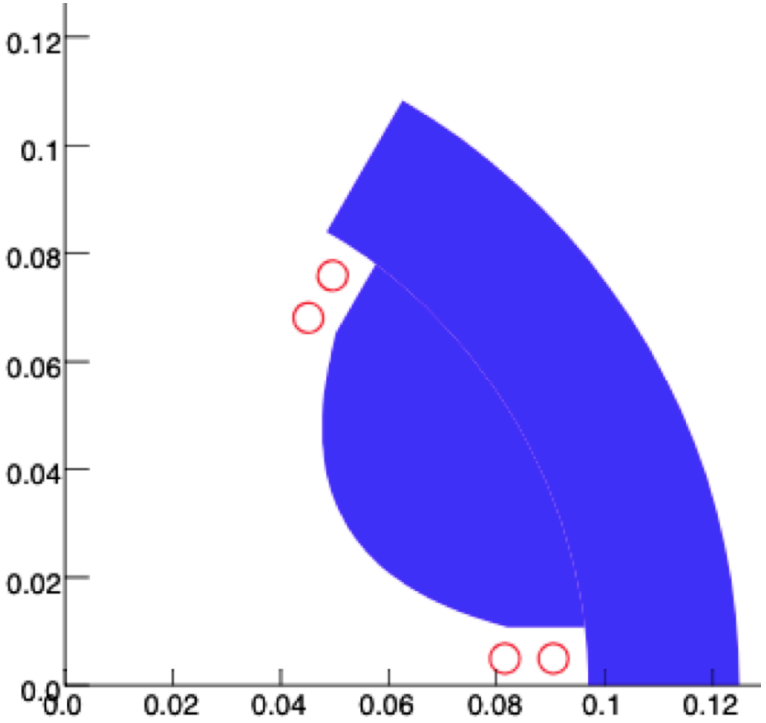
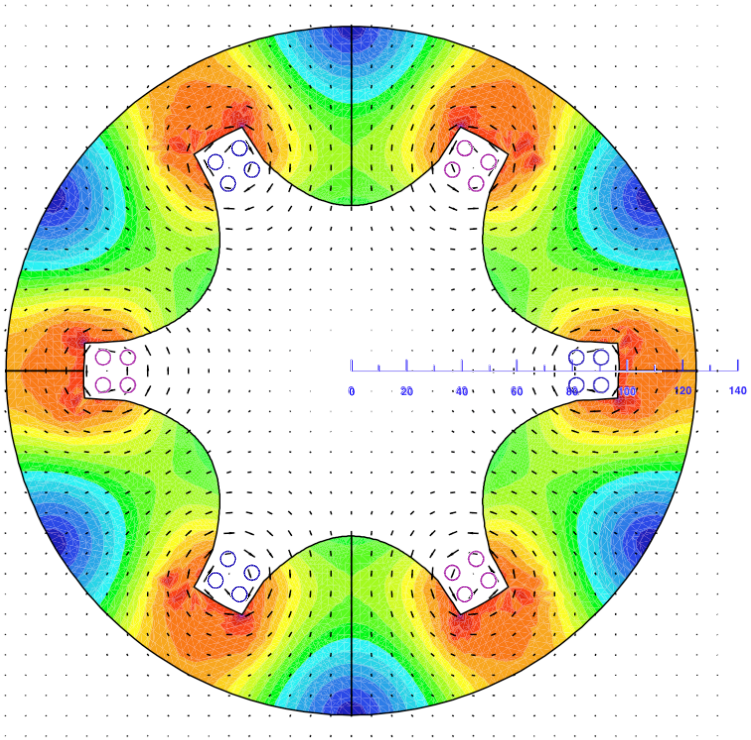
- Chromaticity sextupole
  - Super-ferric type magnet



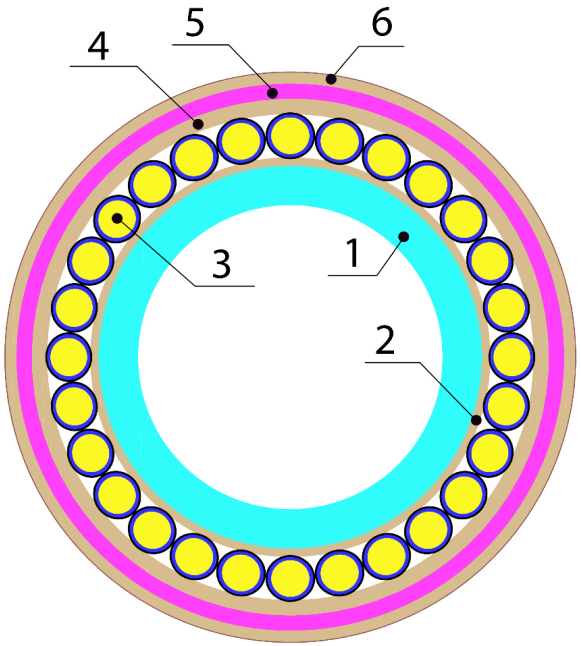


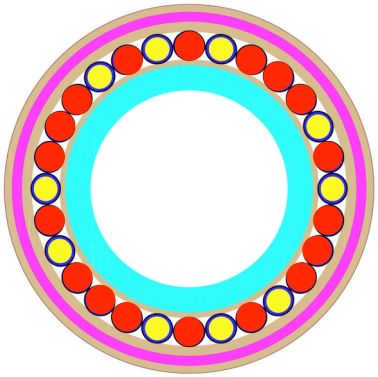
Requirements for correctors

- Common cooling system
  - 2 phase helium, tube cooling
    - Nuclotron type cable
- Low current < 300A
  - In order to minimize heat load from current leads.

Cable for correctors

- Nuclotron type cable with ***insulated wires***
  - Connect wires in series
  - By replacing sc. wire, operation current is adjustable.





ex.
10 sc. wires cable
for the quadrupole corrector

1. CuNi tube
2. Kapton, t=0.05mm, 1 layer, 50% overlapped
3. Superconduting wire, 0.5mm diameter, with enamel
4. Kapton, t=0.05mm, 2 layers, 50% overlapped
5. CrNi wire, 0.2mm diameter
6. Kapton, t=0.07mm, 1 layer, 50% overlapped

Maximum 28 sc. wires

	Multipole			Steerer		Chrom.
Num. of Mag.	12			84		48
	Quad.	Sext.	Oct.	H	V	
Cable length [m]	12	14	17	13	12	13
Num. of wires	10	22	19	28	28	20
Current [A]	249	245	251	260	268	255
Max. field [T]	0.5			0.5		1.2
dB/dt [T/s]	2.1			2.5		6.8