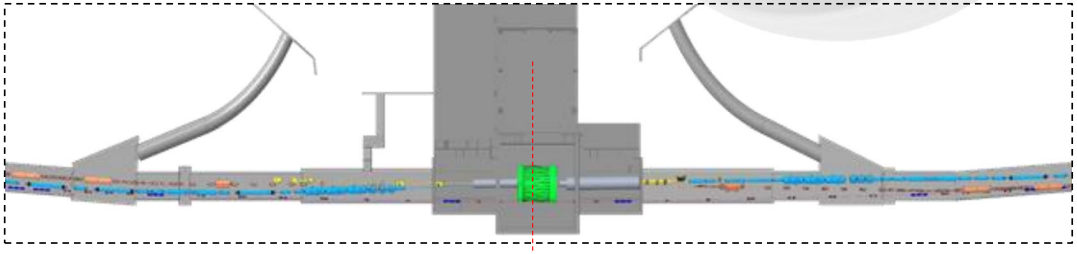
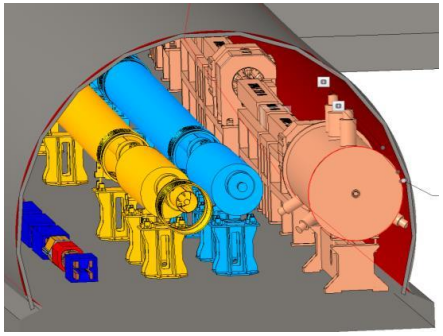
6.06 Second IR (IR8) Development

Contributed by B. Gamage, V. Morozov, R. Rajput-Ghoshal, H. Witte, etc.

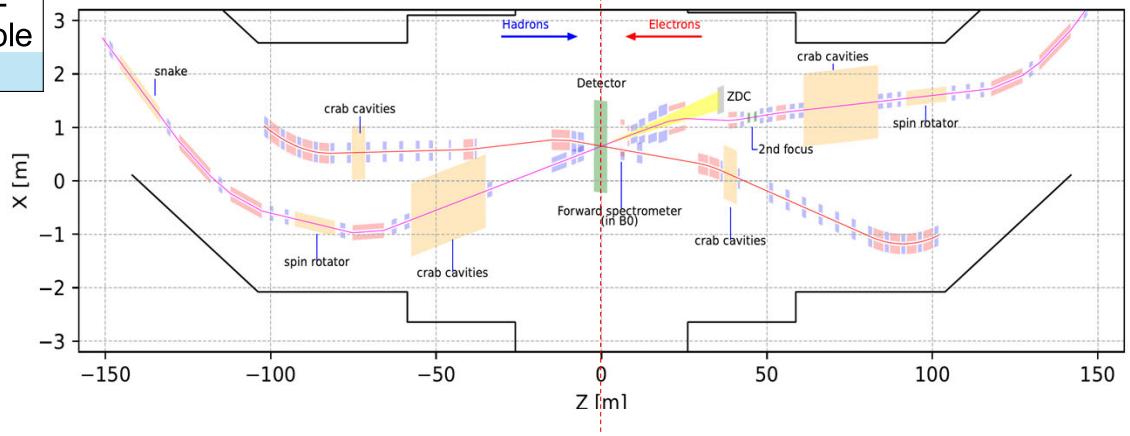
- Design of lattices and optics were completed and optimized.
- Same beam parameters as in the primary IR6 high divergence configurations
- Design supports a secondary focusing required for physics at the secondary detector
- Supporting dual detector operation

	IR6	IR8
Crossing angle [mrad]	25	35
Detector space symmetry [m]	-4.5/5	-4.5/5
Forward angular acceptance [mrad]	20	25
Far-forward angular acceptance [mrad]	4.5	5,4.5
Minimum Δ(Bρ)/(Bρ) allowing for detection of p_T=0 fragments	0.1	0.003-0.01
Angular beam divergence at IP, h/v, rms [mrad]	0.1/0.2 adjustable	0.1/0.2 adjustable
Low Q^2 electron acceptance	< 0.1	< 0.1





Energy (GeV)	41	100	275
β_x (m)	0.85	0.8	0.5
D_x (m)	0.48	0.48	0.47
ϵ_x (mm)	44	30	11.3
$\sigma_x(10^{-4})$	10.3	9.7	6.8
$1\text{-}x_L$ (10^{-3})	4.16	10.2	7



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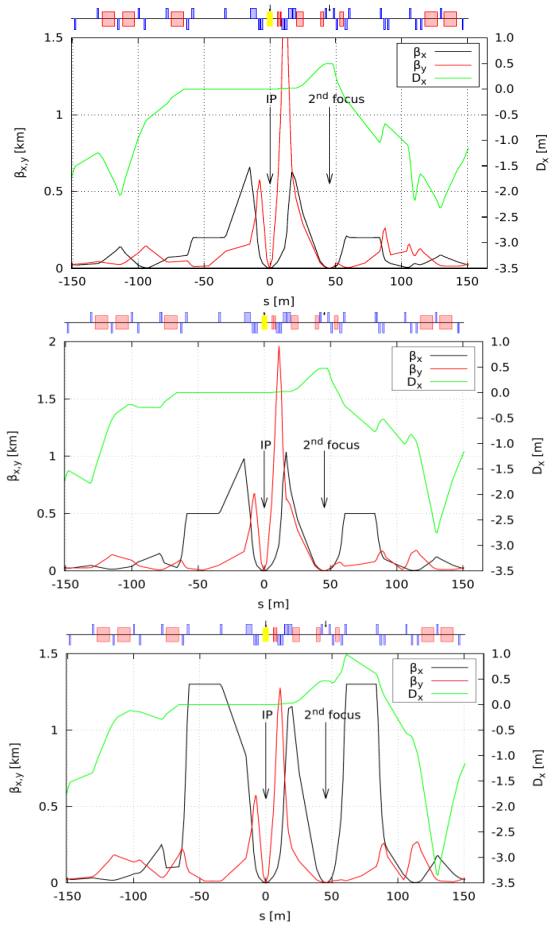
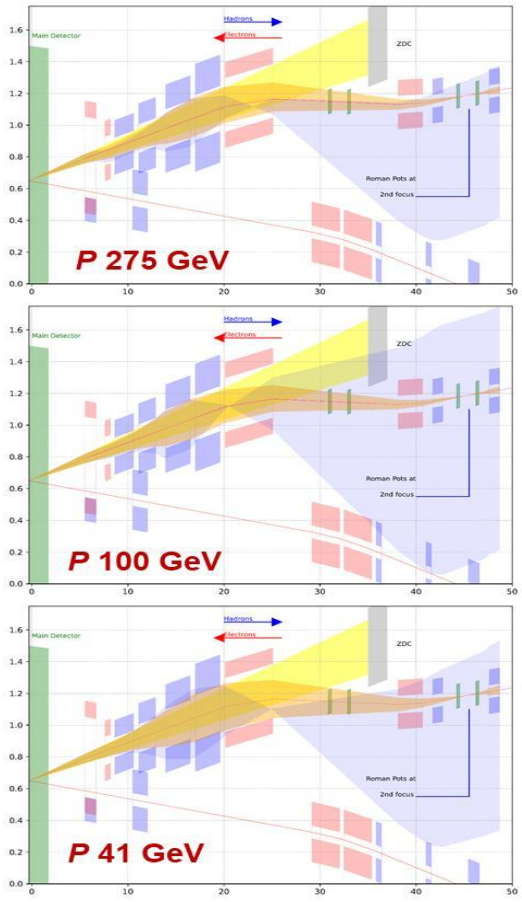
6.06 Second IR (IR8) Development

Beam optics



Proton forward acceptance



Secondary IR Design Report

1. Introduction
2. Update on Design Requirements and Geometric Constraints
3. IR Layout and Detector Acceptance
4. Linear Optics Design
    1. Electron Beam Optics
    2. High Energy Proton Beam Optics
    3. Low Energy Proton Beam Optics
    4. Gold Ion Beam Optics
5. Impact on Beam Dynamics
6. Summary

- A standalone report
- With sufficient technical details
- A condensed version could be included in the EIC technical design report
- Completion of the 1st draft: aiming for 10/01/24

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