6.06 Second IR (IR8) Development

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Present status

- Lattices and optics were optimized, assuming the same beam parameters as in IR6 high divergence configurations
- Supports a secondary focusing required for physics, supports dual detector operation

Documentation

- Documenting the 2nd IR design (working with Aimee Barnard, updating wiki pages)
- Developing a document for machine-detector interface, expect to contribute to EIC Technical Design Report

User support (*https://indico.cfnssbu.physics.sunysb.edu/event/322/*)

- User workshop "Precision QCD predictions for *ep* physics at the EIC: opportunities with a second IR", (Sept 23-27, 2024)
- "Technical realization overview" *Speaker: Sergei Nagaitsev*
- "Second Focus at IR2" *Speakers: Bamunuvita Gamage, Vasiliy Morozov*

- **2nd IR of the EIC**
  - *Beyond the project scope*
  - Explore alternative design choices
  - Compatibility with a 2nd IR is one design requirement
  - Complementary measurements & capabilities to 1st IR
  - Interest and support of the nuclear physics community
- **High-level design goals**
  - Same energy coverage as the 1st IR
  - Detector acceptance satisfying physics requirements (what matters most for the machine design is the forward acceptance requirements)
  - Compatibility running in parallel w/ the baseline detector

- **Work to be done includes,**
  - ~~*Crab cavity space requirement for the 35 mrad crossing angle.*~~
  - ~~*Clearance check for the RCS (Rapid Cycling Synchrotron) bypass.*~~
  - ~~*Account for luminosity sharing by moving the IP by 29.75 cm away from IR6.*~~
  - ~~*Low energy lattices (41,100 for p and 5,10 for e)*~~
  - Further study needed for feasibility of IR magnets.
  - Nb3Sn magnets are being evaluated as an option.
  - Chromaticity compensation with two IRs

2nd IR wiki https://wiki.bnl.gov/eic-detector-2/index.php?title=Project_Information.