

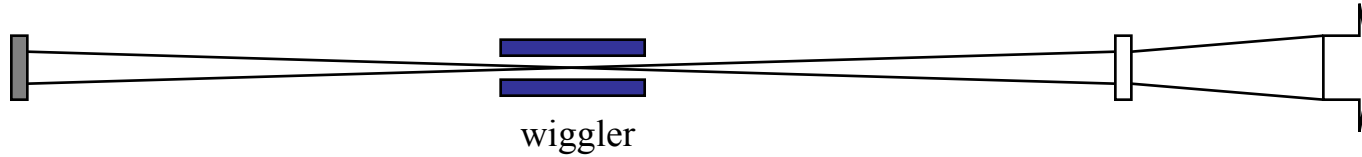
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# **The JLab Ring Resonator – Motivation & implementation**

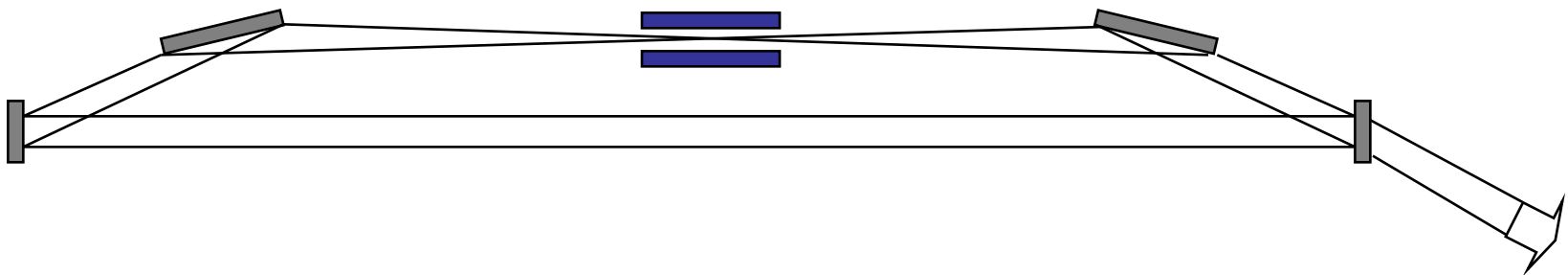
**Joe Gubeli & Michelle Shinn  
JLab September 27, 2012**

# Types of Resonators

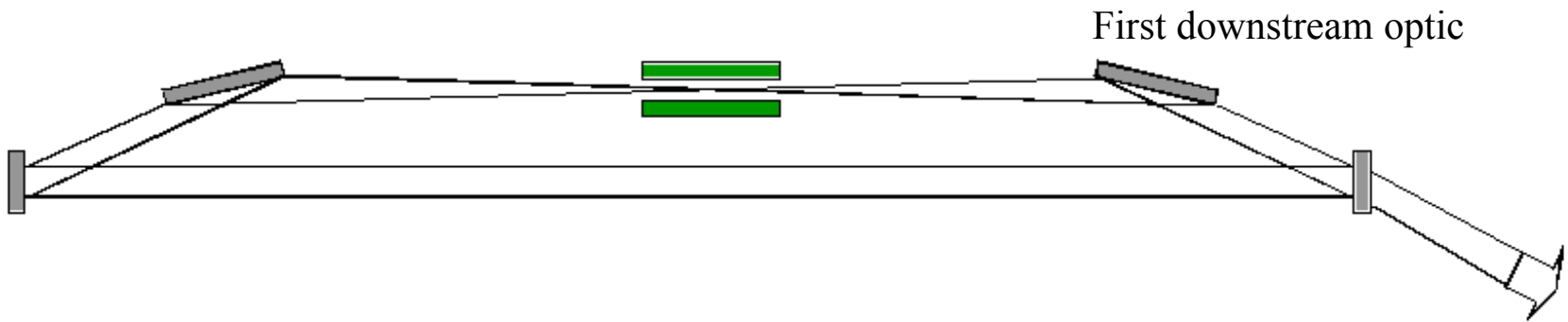
Near-concentric



Ring-near-confocal



# The JLab near-confocal ring resonator

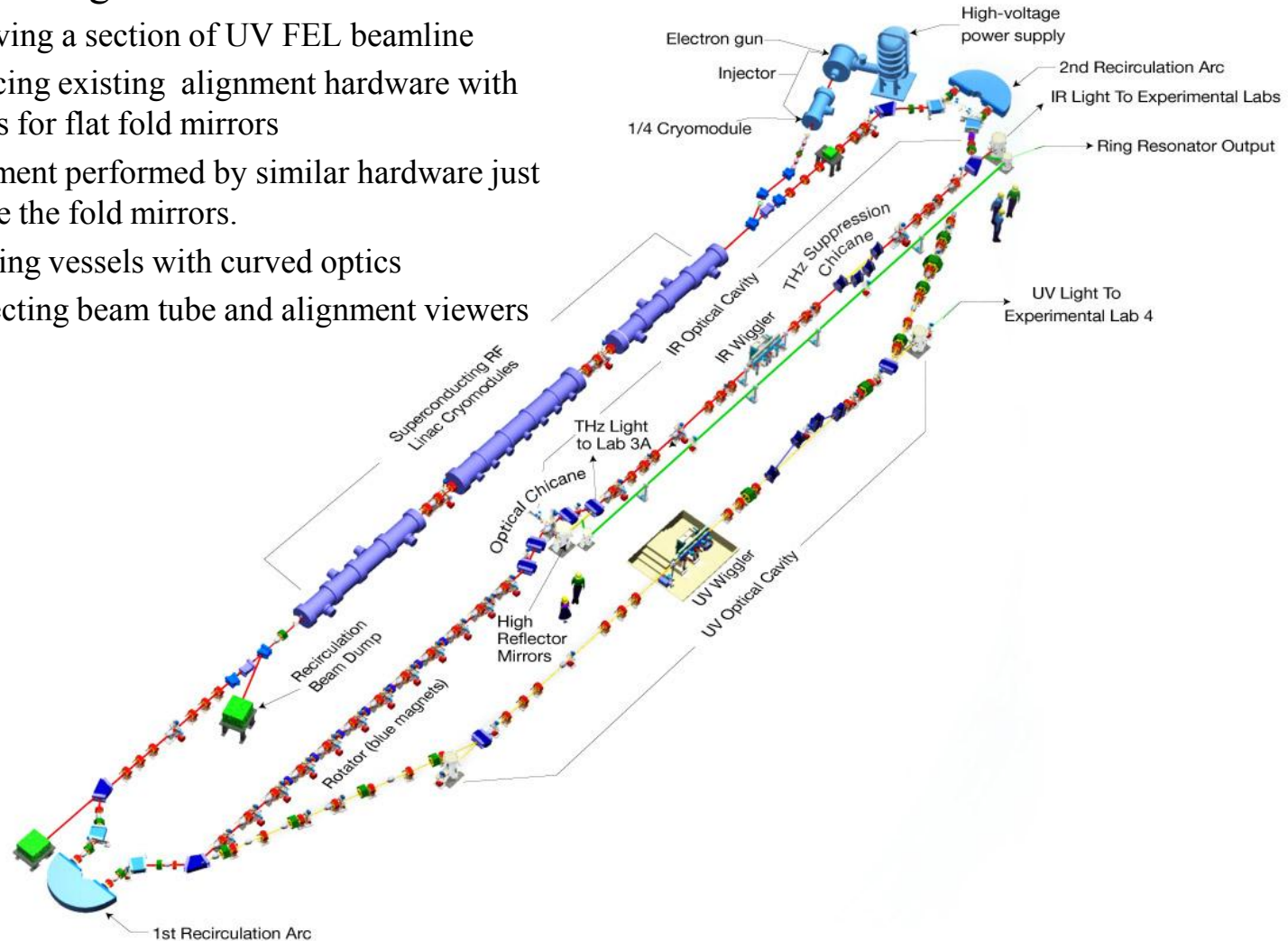


- Extensive FEL optics modeling shows relaxed angular tolerance and need for ROC control, relative to the present FELs at JLab .
- Confirms original analysis.\*

\*Benson, Shinn, Neil - Proc. Of SPIE Vol. 4632 (2002)

# Implementation of the ring resonator at JLab

- Adding the ring resonator entails
  - Removing a section of UV FEL beamline
  - Replacing existing alignment hardware with vessels for flat fold mirrors
  - Alignment performed by similar hardware just outside the fold mirrors.
  - Installing vessels with curved optics
  - Connecting beam tube and alignment viewers



# Groups involved

- Majority of on-site work performed within FEL Div.
  - Optics & I&C groups
- Require Survey & Alignment assistance to survey vacuum vessels containing optics into proper position.
- Facilitates setting proper cavity length – required for lasing.