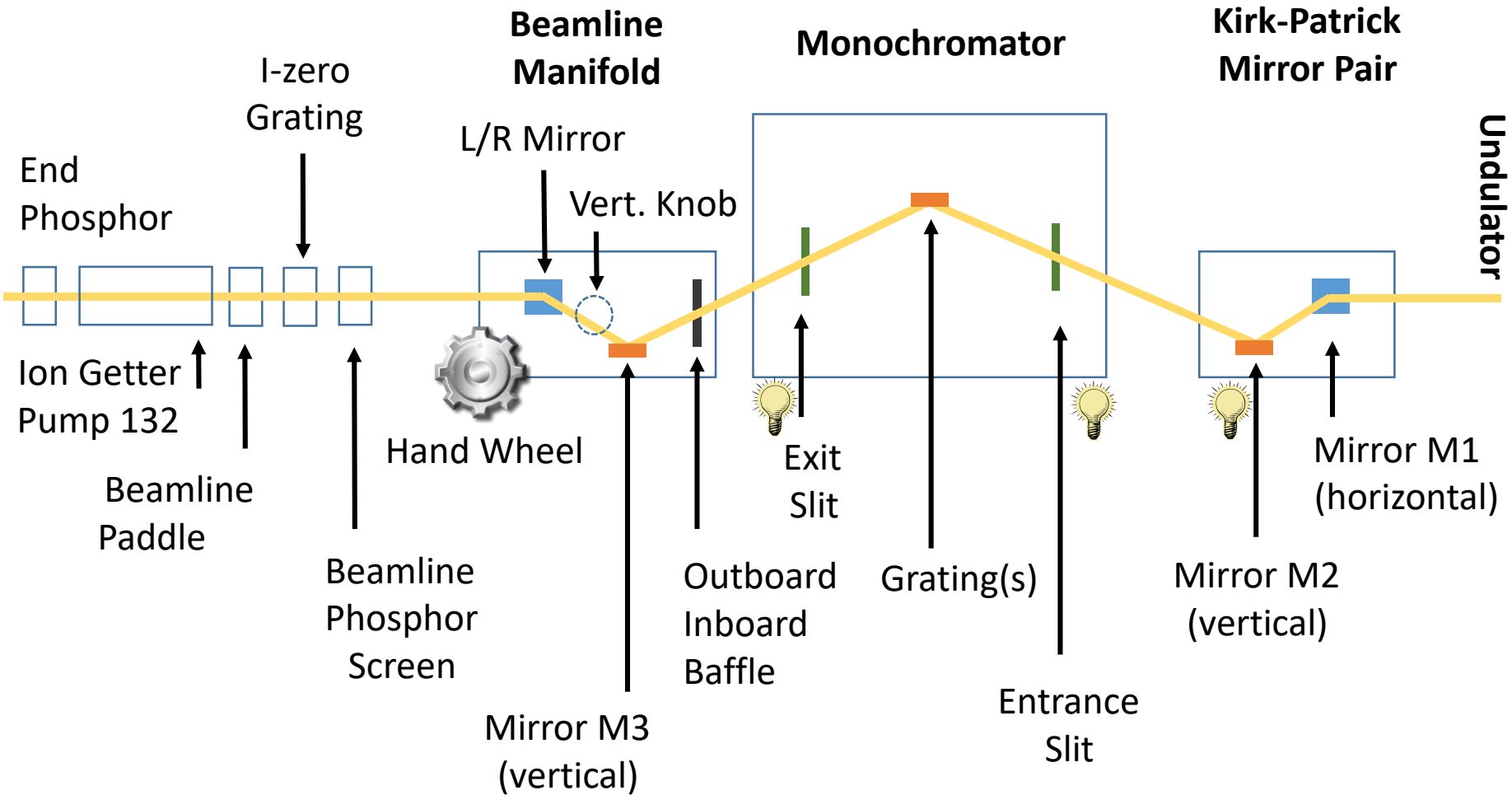
= bright light should be visible through glass flange when shutter is open

Beamline 10.0



Beamline range: Low Energy Grating goes from 18 to 75eV (can technically go up to 92eV but is not reliable in this range)

Contacts: A. Fedorov & D. Kilcoyne

Support: W. Stolte

Scanning: Ask Brian Smith for right port number to actively control the BL via Ethernet

Get the beam through the beamline to your Endstation:

- You may have to switch the grating in the Monochromator first; if so: see last page
- Go to the Beamline Console panel
- Open Beamline Shutter
- Close other Beamline Valves (e.g. VR111) and set respective “EPS” offline
- Open your Beamline Valve (VR131 and VR132) and set respective “EPS” online
- Go on Beamline Computer and move out outboard & inboard baffle: set to 2 to 5mm

  (can be done in “Motor Display” & “Inboard/Outboard Baffle”)
- Bring in the beam horizontally to your Beamline: Try the computer console first by going to “Motor Display” & “Switchyard Motor” and set this to -69.45mm. If this does not work do it physically moving L/R Mirror with the handwheel (on beamline console side) so that the Aluminum Block on the post is lined up to “L” (handwheel is taken off but still with BL scientist)
- On the Beamline Computer change the M3 Mirror (“vertical focusing”) to 999V (higher voltages are desired; 1050V went as well). This is kind of a max. value to set the focus as far out as possible. With the new endstation position it may make sense to play with this value once the beam is on the target phosphor.
- Dial in a start photon energy (“mono energy”) of 30 to 35eV with a resolution of 500meV or less optimistic 55eV with 40x600microns (entrance & exit slit); goto “beamline resolution” & “normal abs”

- Enable “Exit Slit”, “ ID energy”, (and perhaps “Energy Res”) on “Gap Compensation”
- Go to the Beamline and physically carefully move down the I-zero grating to measure the current on the Keithley Ampere-meter (on beamline console side)
- On Beamline Computer (“Motor Display”) set New M1 horizontal mirror to the middle position of 7 microns. Set New M1 vertical mirror to around 0.8 to 3.6microns (while it actually should be 7 also); optimize the “jog” of the M2 mirror in 0.05microns steps to maximize the I-zero
- Try to see the light on Beamline Phosphor screen and then on the End-Phosphor screen
- Go back to Beamline Computer and reduce the outboard & inboard baffle: Drive in the Baffles till you cut 5 – 15 % on each side to cut out the higher harmonics to the left and right
- Put in the Beamline Paddle over the 1x1cm opening next to differential Ion Getter Pump 132 (line it up to the central line) and adjust the left/right beam position manually by moving the L/R Mirror at the computer console (“Switchyard Motor”) or manually with the hand wheel and the up/down position of the M3 mirror by turning the hidden “vert. knob” under the L/R Mirror (it should read “-1.00” on the micrometer gauge which is mounted upside down – you may have to turn it on with a flash light shining on it): 50% goes on the paddle while 50% goes through. Take the paddle out.
- A typical resolution for data taking should be 10 to 30meV
- Typical values are 10microns at the entrance slit and 15microns at the exit slit

- The beamline performance will fluctuate during the warm-up period which can last a few hours: Especially the M2 mirror is sensitive and reacts to outside temperatures. Optimize the Jog in 0.05 micron steps by either looking at the I-zero grating or the electron or ion rate (bring rate via a BNC cable to a voltmeter close to the computer).
- After a couple of hours of operation redo the baffles again: Prevent the beam from going in the chamber (e.g. close the last shutter before the endstation or rotate a phosphor in). Set photon energy to ~35eV and open the slits (e.g. 200x600 microns). Bring in the I-zero grating and open each baffle to 3mm. Read the I-zero and cut the beam by 5-15% with the outboard baffle and then by 5-15% with the inboard baffle. Adjust the M2 mirror again in 0.05micron steps for maximum I-zero. Close down the slits again (e.g. 15x15 microns) and let the beam in the endstation.
- Note that you can use the L/R Mirror to hit the target in the endstation

Changing the Grating in the Monochromator:

- We usually want the low energy grating (380 l/mm)
- Go on the side next to the ring of the Monochromator and find the linear motion feedthrough in the middle of the tank (get yourself a stepstool to get up there).
- Peek through the 2.75in glass flange to the left of it to dock the linear feedthrough to the grating mount.
- Drive in the shaft of the feedthrough to the little funnel and lock the ensemble.
- Look to the monitor to the left: you need to line up the respective number to the respective mark (e.g. it's "2" for the low energy grating, "20" for the high energy grating)
- Move the grating by driving the shaft of the linear feedthrough in or out.
- Once the grating is in position detach the shaft of the linear feedthrough from the grating mount and retract it.
- Choose the right grating and harmonic on the beamline control computer.