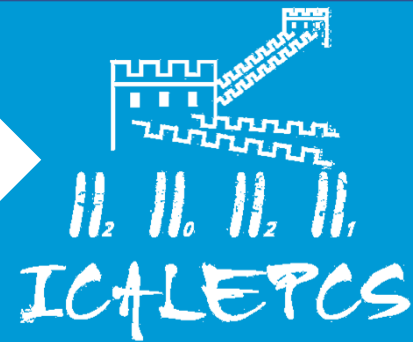


MOTION CONTROL IMPROVEMENTS FOR THE KIRKPATRICK-BAEZ MIRROR SYSTEM FOR SIRIUS/LNLS EMA BEAMLINE

G. N. Kontogiorgos, C. S. B. N. Roque, M. A. L. Moraes
Brazilian Synchrotron Light Laboratory (LNLS), Campinas, Brazil



FMB Oxford KB Mirror System

Sirius Beamline Coordinate System

- Control implemented on Omron Delta Tau Power Brick LV
- Driving Low Current Motors with High Current Amplifier
- Mirror Benders motors driven in Gantry Mode
- Capacitive Sensors analog signals read in the controller
- New VFM Base Tripod Kinematics

FROM LUX XDS BEAMLINE TO SIRIUS EMA BEAMLINE

HFM Mirror Bender Mechanism

Driving low current motors with high current amplifiers by limiting the output PWM duty cycle

Proof of concept

Starting from 95% of the full value of $PwmSf$, the percentual of the scale factor was reduced to zero and current measurements were performed at each scale factor value. The mean value of each measurement was calculated and plotted.

Coil A mean current [mA]

PwmSf percentual

Mirror Benders motors driven in Gantry Mode but maintaining ability to adjust their relative position

Capacitive Sensors analog signals read in the Power Brick LV controller aims for future improvements

"Positioning Difference" = 45°

Starting position (zero)

Bender 2

Bender 1

LS+

Trajectory

"Offset" = 10°

Zero

Bender 2 from 45° to 35°

Bender 1 from 45° to 35°

LS+

Trajectory

Capacitor voltage vs Motor

- VFM in vacuum
- VFM in air
- HFM in air
- HFM in vacuum

New VFM Base Tripod Kinematics

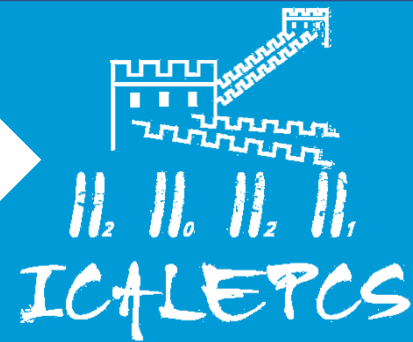
VFM Tripod Mechanism

Kinematics joint scheme for geometric modelling

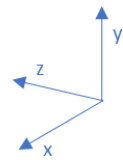
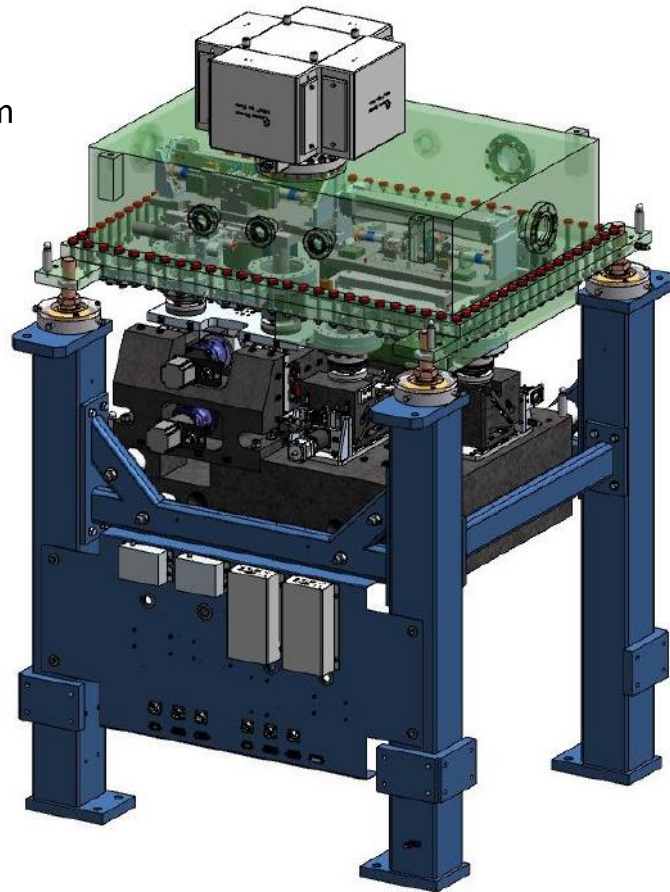
Test graphic user interface for KB operation

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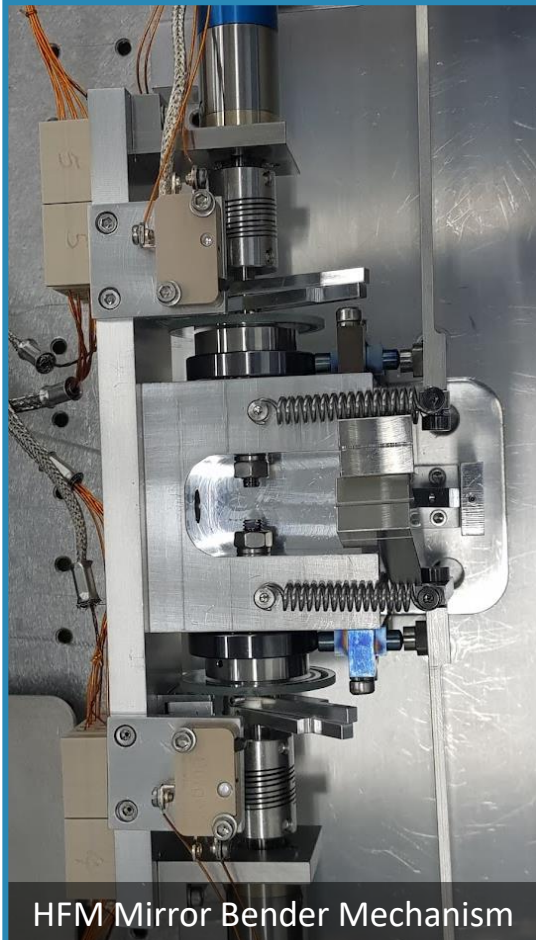
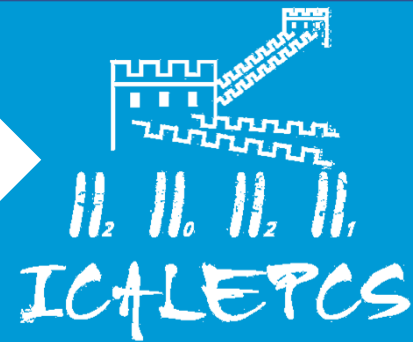
Capacitive Sensors analog signals
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New VFM Base Tripod
 Kinematics

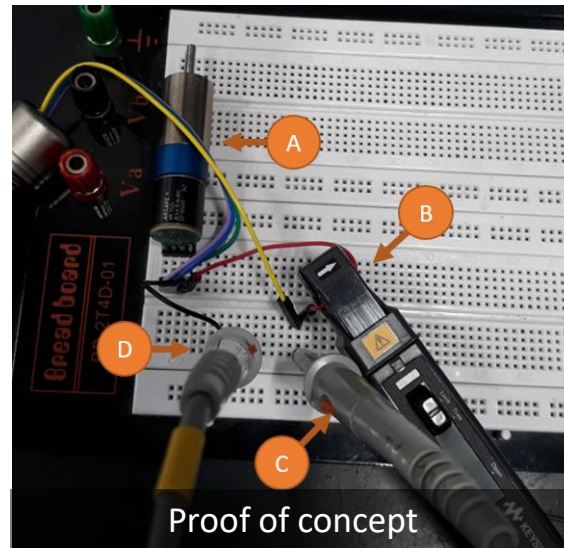
FROM UVX XDS BEAMLINE TO SIRIUS EMA BEAMLINE

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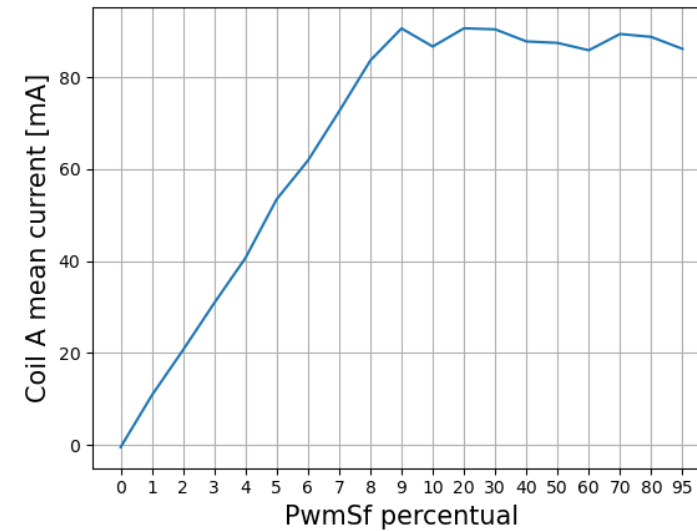
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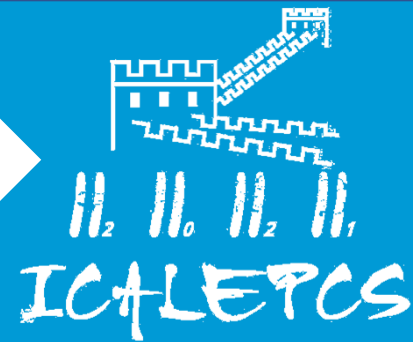


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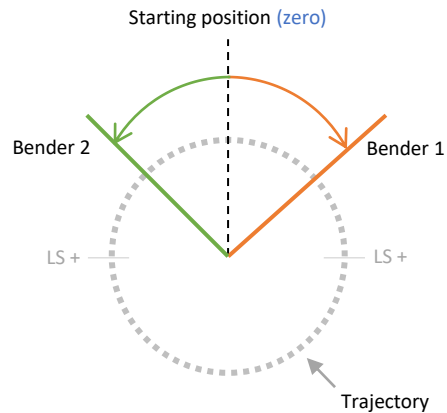
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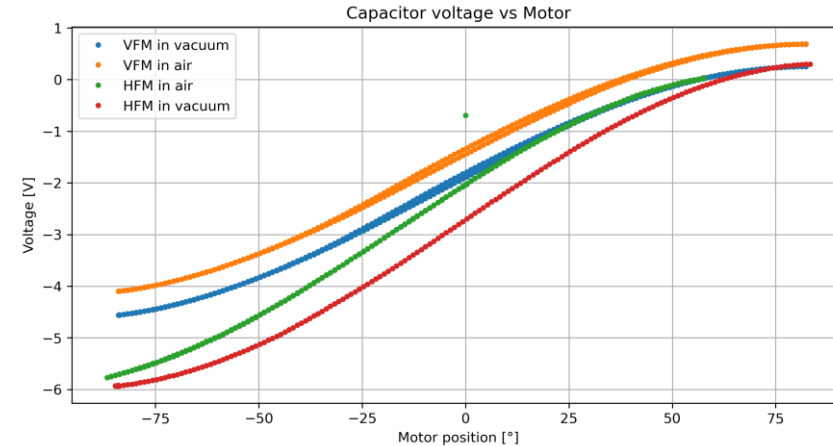
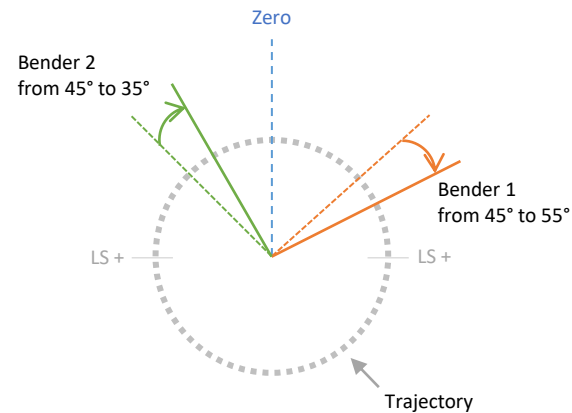
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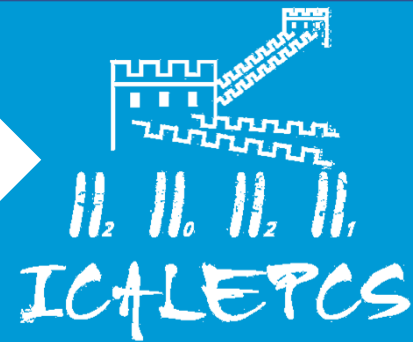


“Offset” = 10°

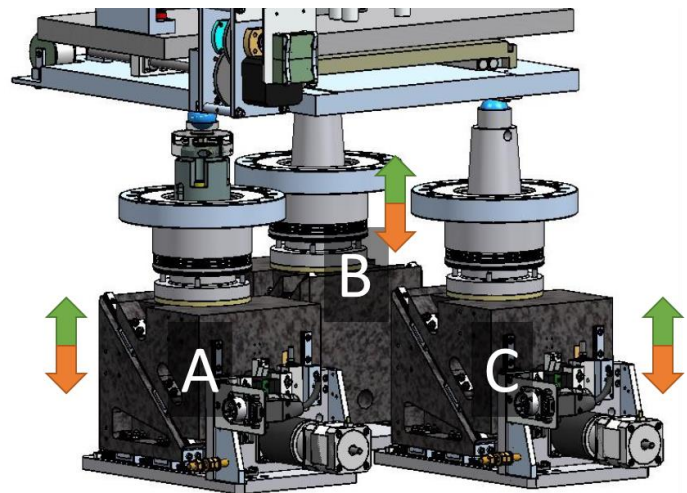


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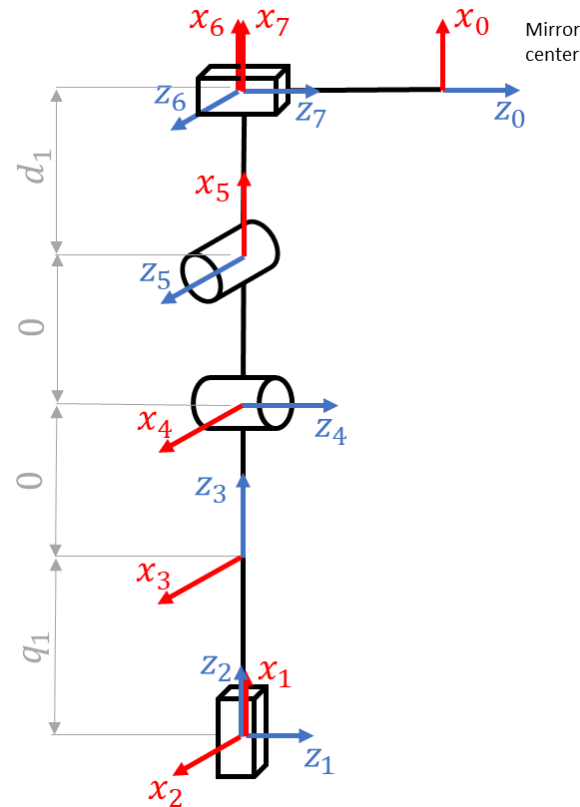
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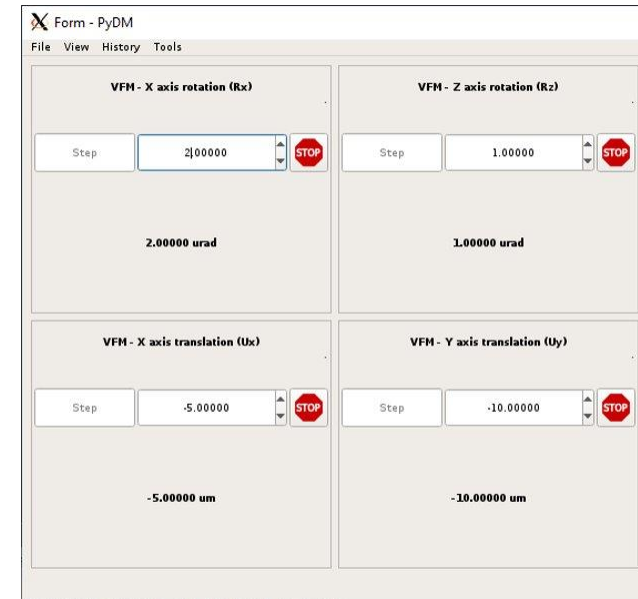
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