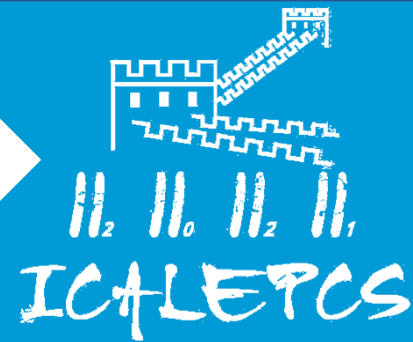


## MOTION CONTROL IMPROVEMENTS FOR THE KIRKPATRICK-BAEZ MIRROR SYSTEM FOR SIRIUS/LNLS EMA BEAMLINE

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.

PwmSf percentual	Coil A mean current [mA]
0	0
10	10
20	20
30	30
40	40
50	50
60	60
70	70
80	80
90	80
95	80

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°

"Offset" = 10°

Capacitor voltage vs Motor

Motor position [°]	VFM in vacuum [V]	VFM in air [V]	HFM in vacuum [V]
-75	-5.5	-4.5	-3.5
-50	-4.5	-3.5	-2.5
-25	-3.5	-2.5	-1.5
0	-2.5	-1.5	-0.5
25	-1.5	-0.5	0.5
50	-0.5	0.5	1.5
75	0.5	1.5	2.5

New VFM Base Tripod Kinematics

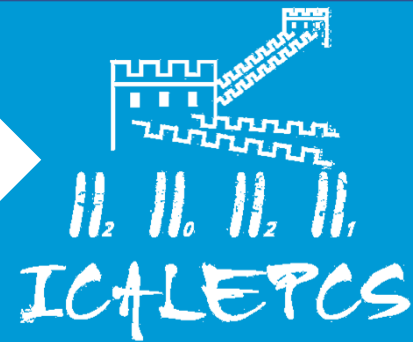
VFM Tripod Mechanism

Kinematics joint scheme for geometric modelling

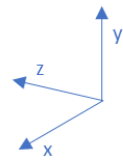
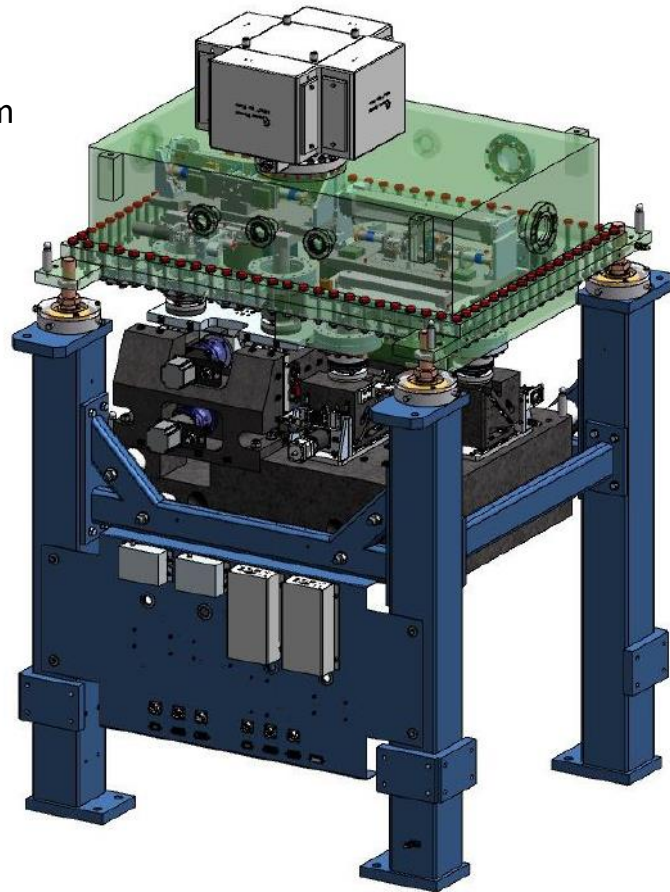
Test graphic user interface for KB operation

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FMB Oxford  
 KB Mirror System



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Driving Low Current Motors with  
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Mirror Benders motors driven in  
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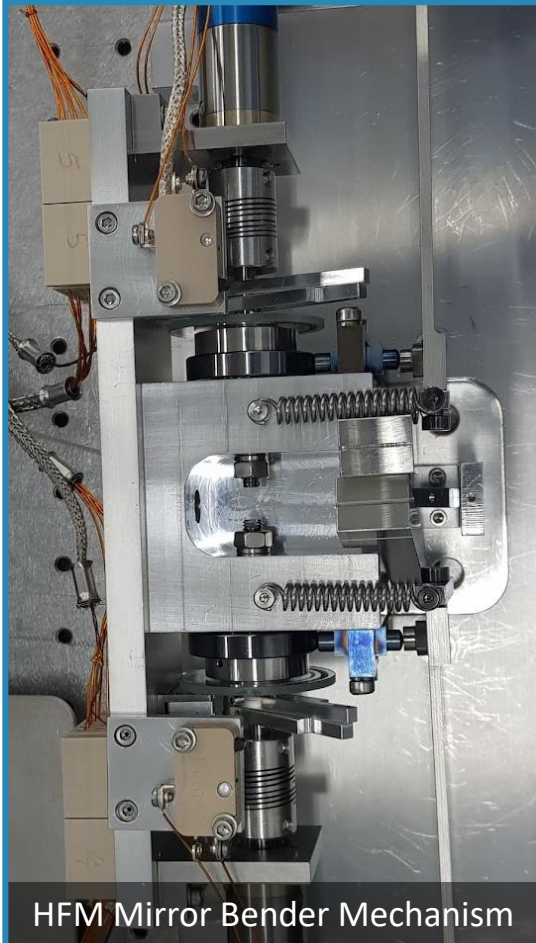
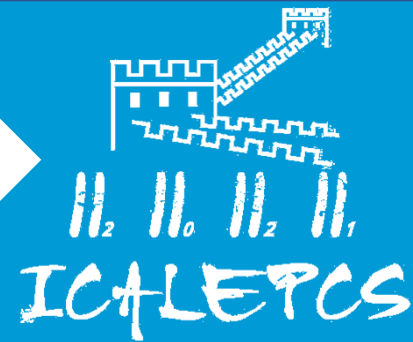
Capacitive Sensors analog signals  
 read in the controller

New VFM Base Tripod  
 Kinematics

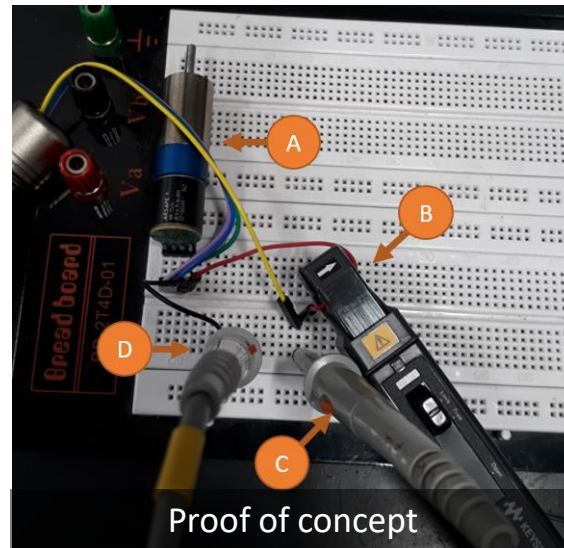
FROM UVX XDS BEAMLINE TO SIRIUS EMA BEAMLINE

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

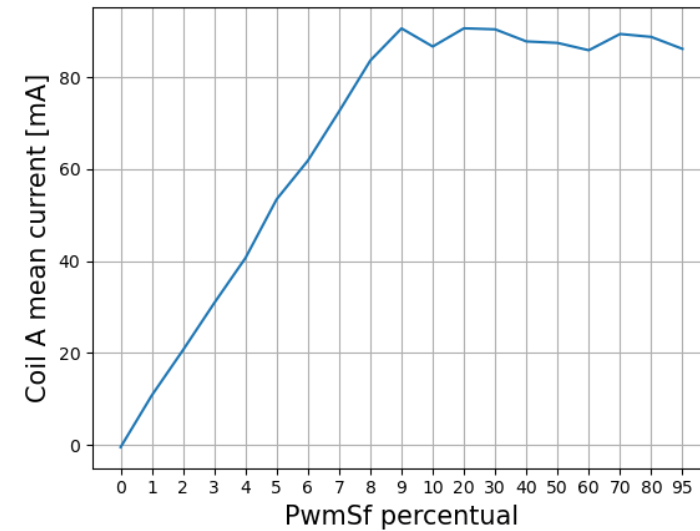
G. N. Kontogiorgos, C. S. B. N. Roque, M. A. L. Moraes  
 Brazilian Synchrotron Light Laboratory (LNLS), Campinas, Brazil



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

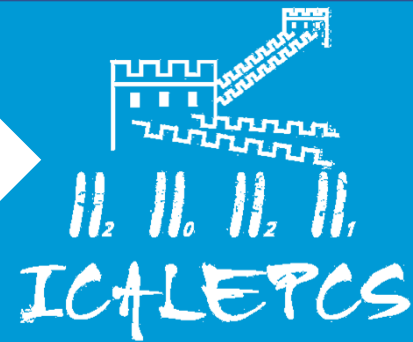


Starting from 95% of the full value of PwmSf, the percentual of the scale factor was reduced to zero and current measurements were performed at each scale factor value. The mean value of each measurement was calculated and plotted.



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

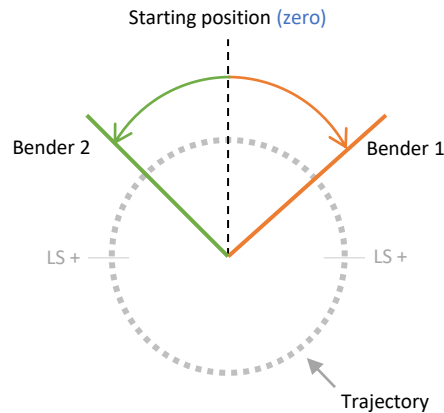
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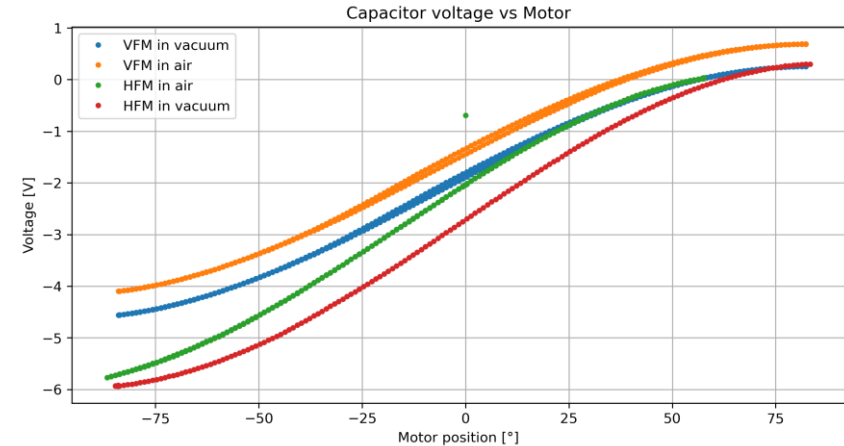
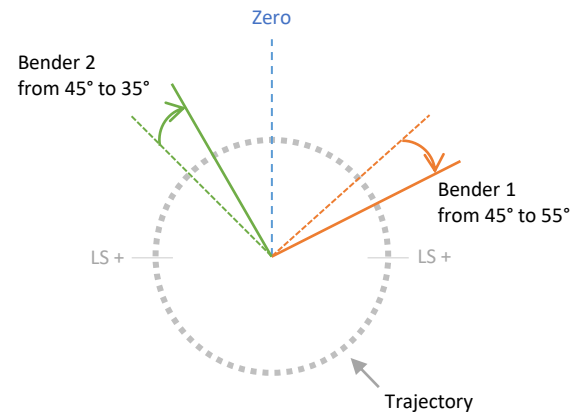
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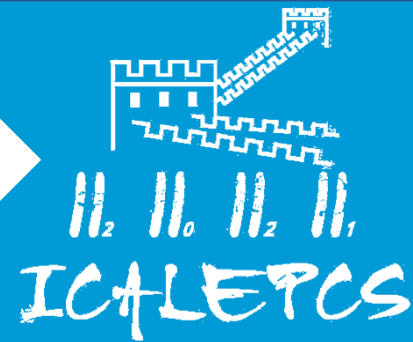




TUPV002

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

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Brazilian Synchrotron Light Laboratory (LNLS), Campinas, Brazil



New VFM Base Tripod  
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