



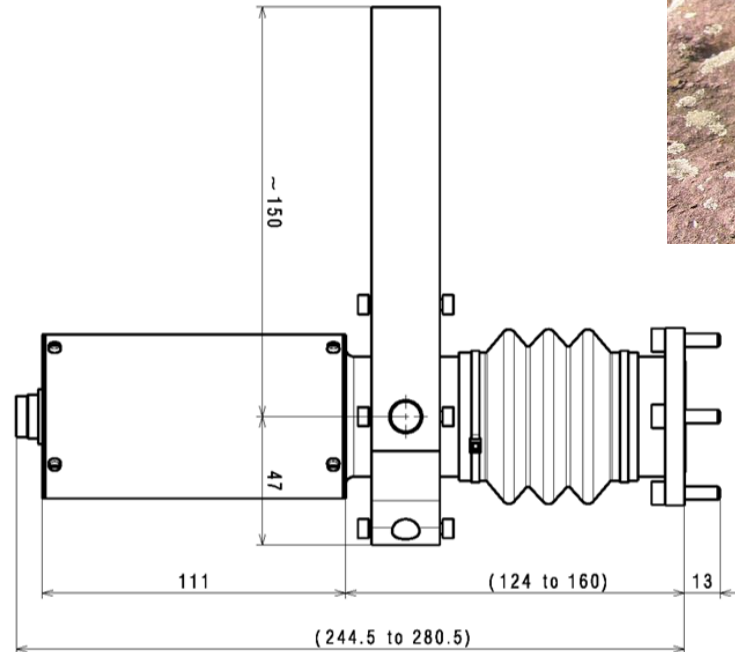
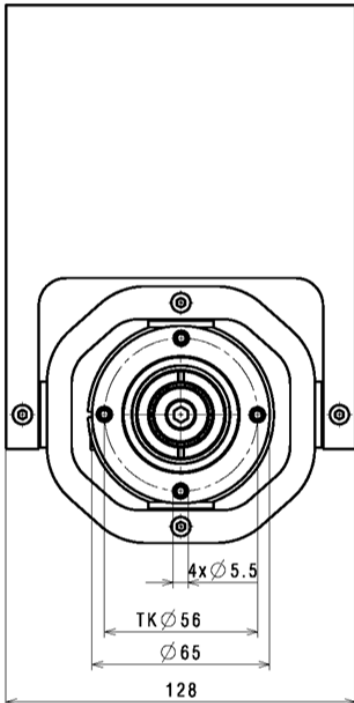
# AMC update

LST meeting 16.01.2011

A. Gadola, S. Steiner

# Zurich actuators

- AMCs tested on rooftop: 2'071'193 cycles
- 710 € / mirror for 200 pcs. (January 2011)
- Price reduction through further mechanic improvements and larger series production



# Mass production

200 pcs. of each actuator type and fix point already produced for MST prototype



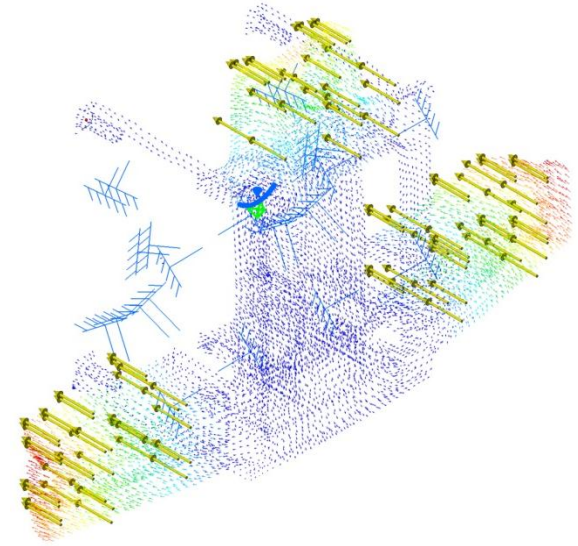
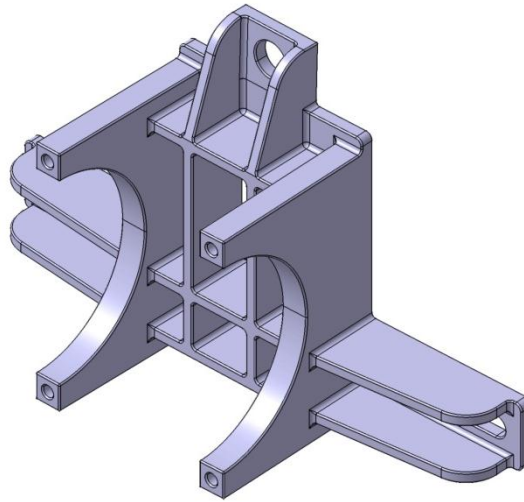
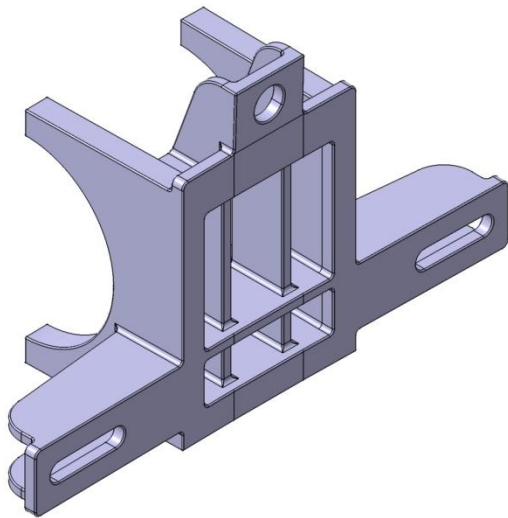
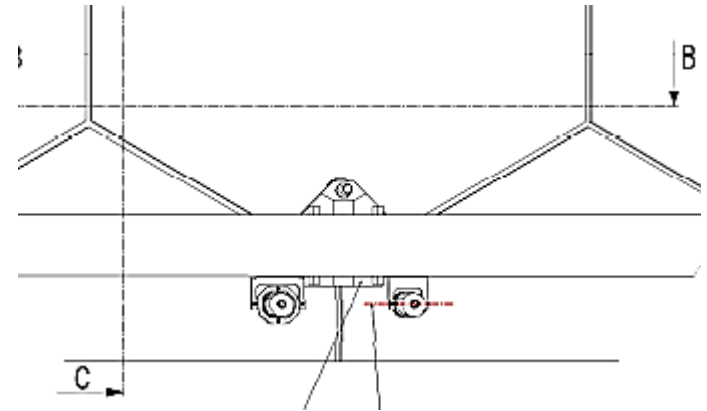
# Specifications

Characteristics:		Note:
Dimensions	244 – 280 mm x 65 mm (L x $\emptyset$ )	Without gimbal
Weight	1285 g	Actuator
	805 g	Fixpoint
	754 g	1 dof gimbal
	987 g	2 dof gimbal
Power supply	18 – 24 VDC	
	$\leq 850$ mA	Driving current
	$\leq 50$ mA	Standby current
Communication	Wireless, industry standard (IEEE 802.15.4)	
Positioning	Absolute with Gray code and Hall sensor	
Positioning precision	30 $\mu$ m with Gray code only	
Mechanical clearance	$\pm 10$ $\mu$ m	Without gimbals
Elevation speed	0.5 mm/s	
Full stroke length	36 mm	
Moving force	$> 350$ N	
Mechanical stress	$< 9'500$ N	
Production costs <sup>(1)</sup>	One actuator: $\leq 180$ €	Incl. manpower
	One mirror: $\leq 694$ € (incl. gimbals, fixpoint)	
Degree of protection	IP 67	
Connectors	1 connector for power supply	
Holding force	Self-locking	
Built-in memory	4096 bytes = 2048 elevation angles	Look-up table
Lightning protection	To be discussed	

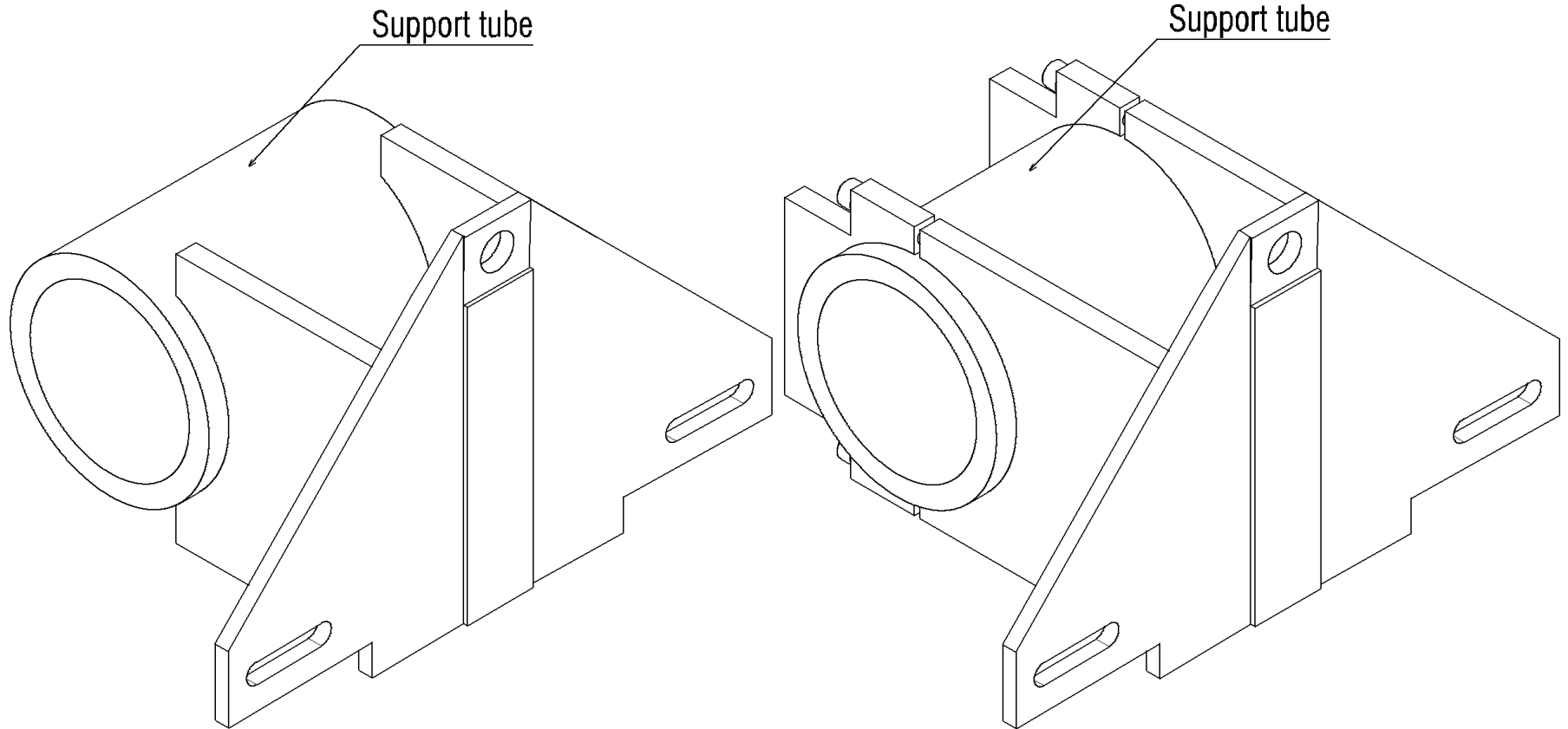
Table 1: Specifications of the Zurich actuator. <sup>(1)</sup> The production costs depend strongly on the number of actuators produced. The prices as shown are based on a production series of 4'000 actuators based on industry offers from the year 2010.

# Mirror support plate (MST)

- **Study for MST** including FEM calculations
- Shape and size to be adopted for LST?
- Chill or sand casted aluminum
- Weight  $\approx 3.5$  kg
- Price per piece  $\approx 145$  € for small series



# Mounting options



Support plate  
welded

Support plate  
clamped

# Support plate price overview

## Chill casting:

chill mold	CHF 15'000
130 pcs. incl. threads	CHF 7'800
<b>Total</b>	<b>CHF 22'800</b>

chill mold	CHF 15'000
130 pcs. hardened and machined all over	CHF 11'700
<b>Total</b>	<b>CHF 26'700</b>

## Sand casting:

casting pattern	CHF 3'000
130 pcs. hardened and machined all over	CHF 18'460
<b>Total</b>	<b>CHF 21'460</b>

Prices base on an industry offer 2010.

# Outlook

- Test of 200 actuators on MST prototype
- Contact for CAD drawings etc.:  
agadola@physik.uzh.ch