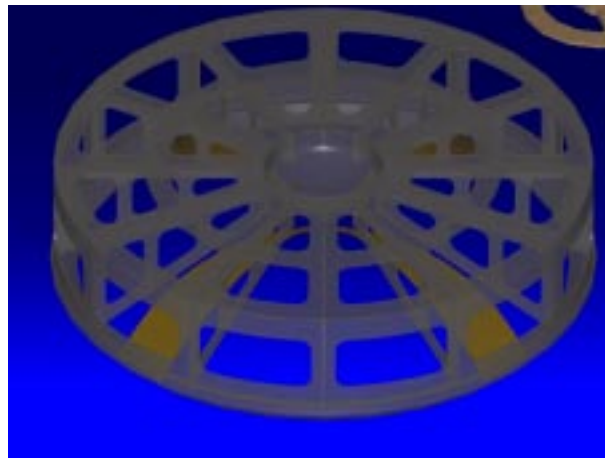


LSC Meeting

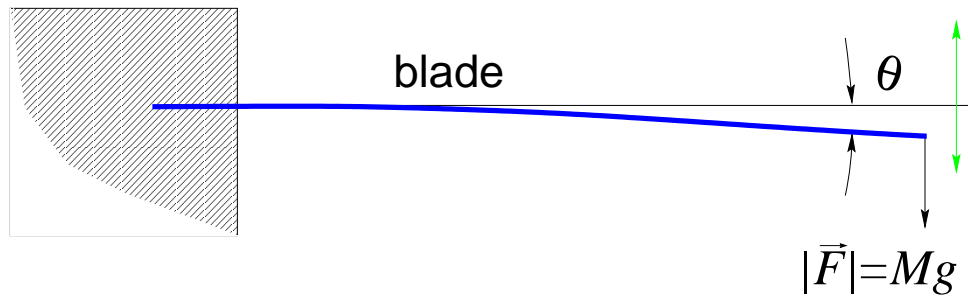
University Of Florida,
Gainesville March 1999

Preliminary Results of the Seismic Filter Prototype

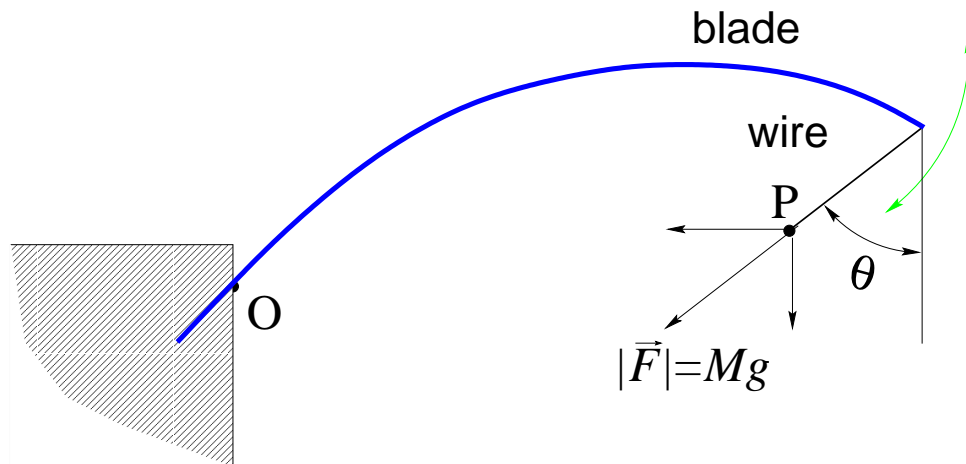
Virginio Sannibale



Geometric “Anti-Spring” Effect



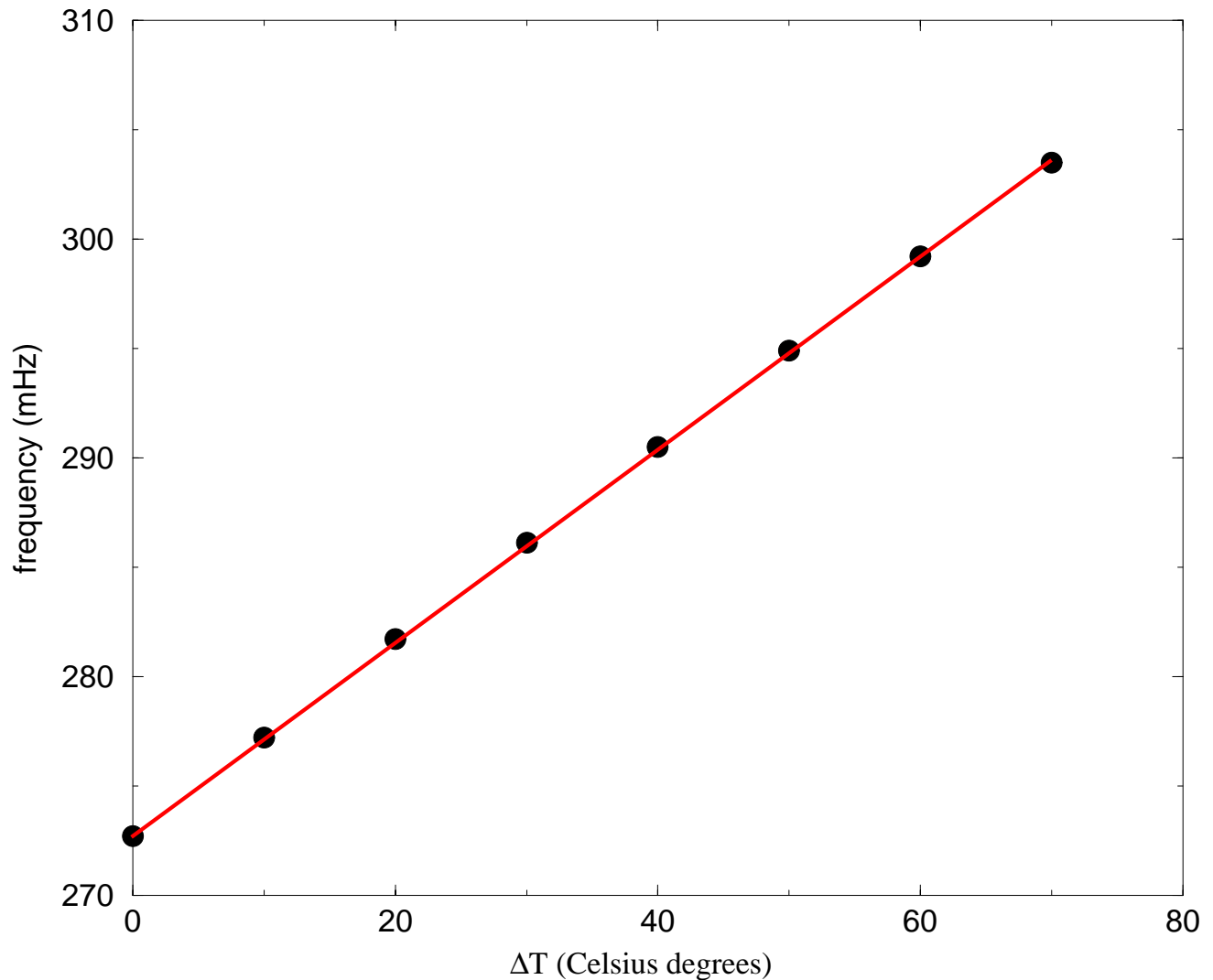
One-dimensional Kinematics of the blade edge
 (1 Spring Constant)



Two-dimensional Kinematics of the blade edge
 (3 Spring Constants)

Blades: Thermal Stability

(Vertical Res. Freq. versus Temperature)

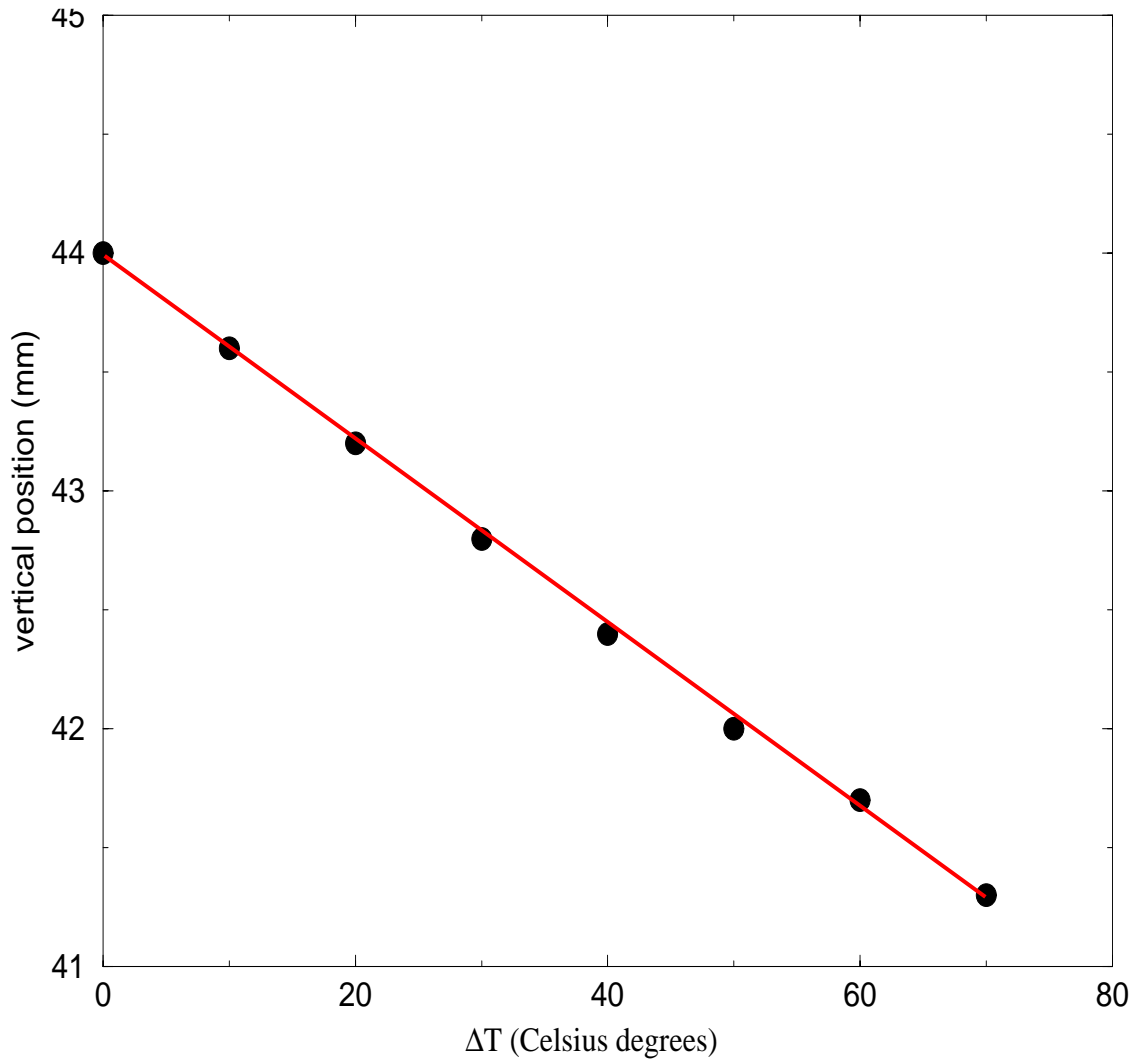


Constant load : 448 N

- Sensitivity : $\frac{\Delta\nu}{\Delta T} = 0.5 \text{ mHz/ } ^\circ\text{C}$
- Sensitivity Magnetic Anti-Springs: $\left\langle \frac{\Delta\nu}{\Delta T} \right\rangle_{exp.} = 19.3 \text{ mHz/ } ^\circ\text{C}$

Blades: Thermal Stability

(Vertical Plate Position versus Temperature)

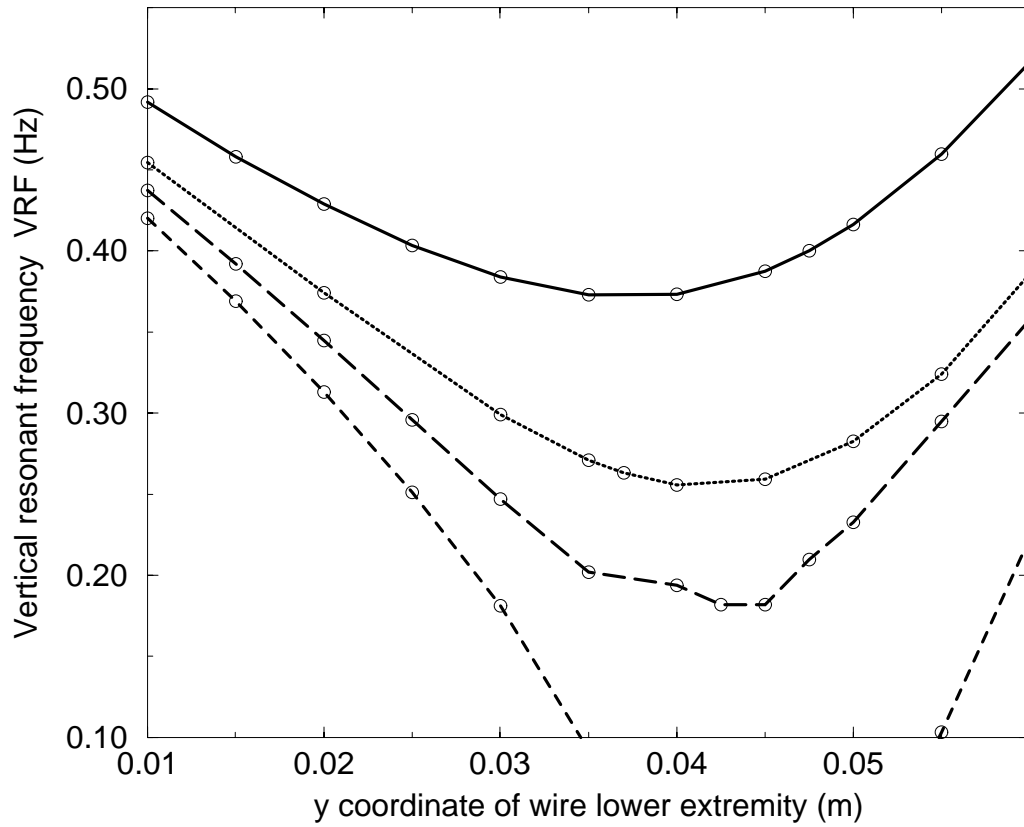


Constant load : 448 N

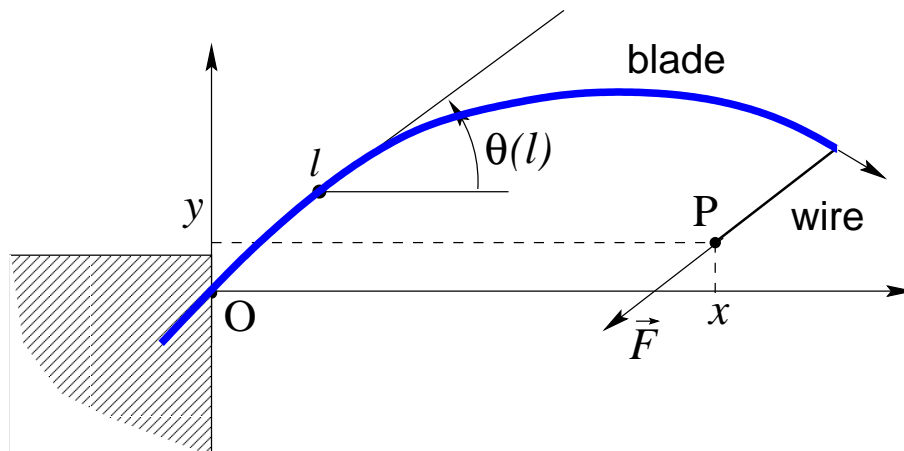
- Sensitivity : $\frac{\Delta y}{\Delta T} = 40 \mu\text{m}/^\circ\text{C}$
- Sensitivity Magnetic Anti-Springs: $\left\langle \frac{\Delta y}{\Delta T} \right\rangle_{exp.} = 394 \mu\text{m}/^\circ\text{C}$

Geometric Anti-Spring

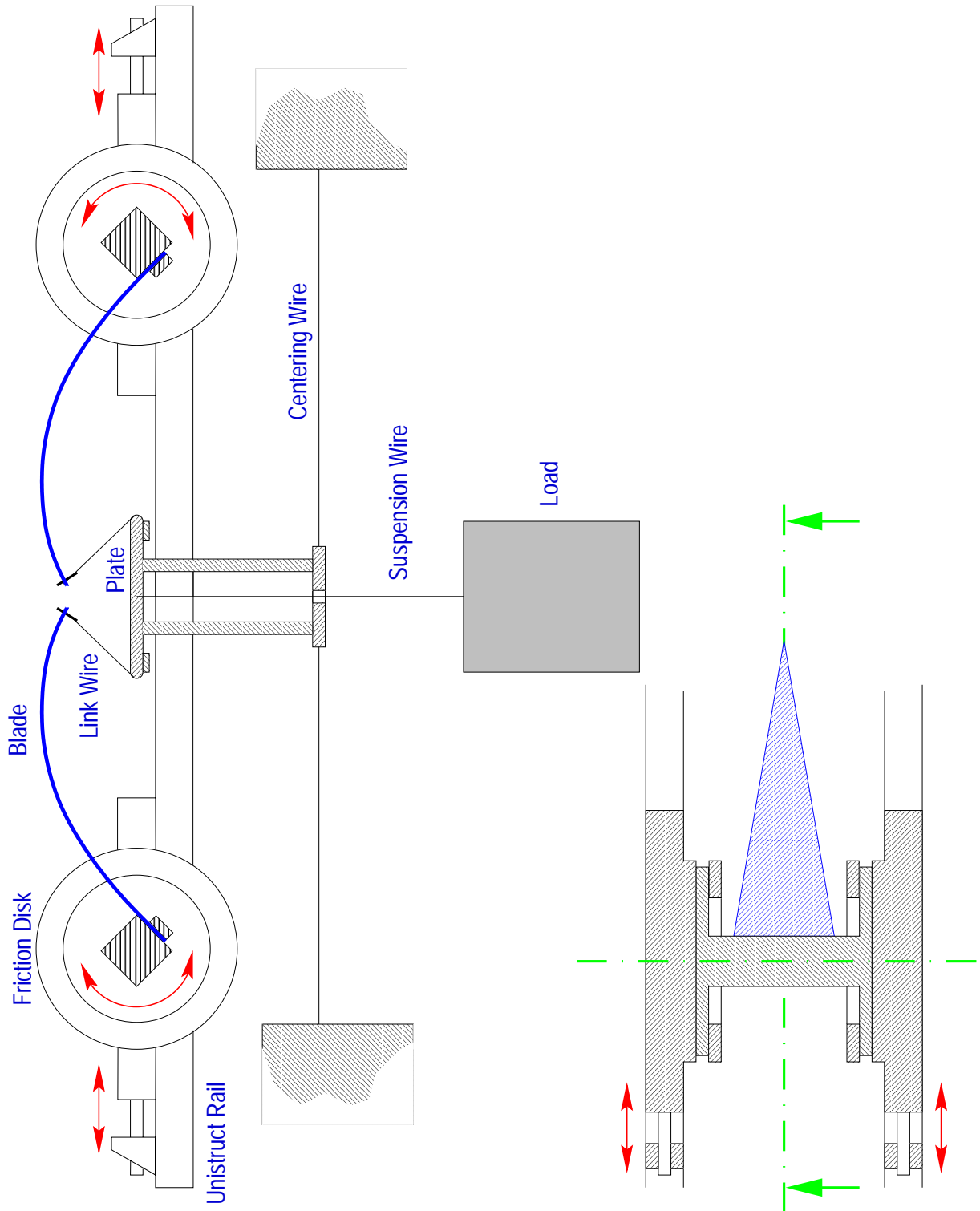
(Geometric Configuration and Freq. Tuning)



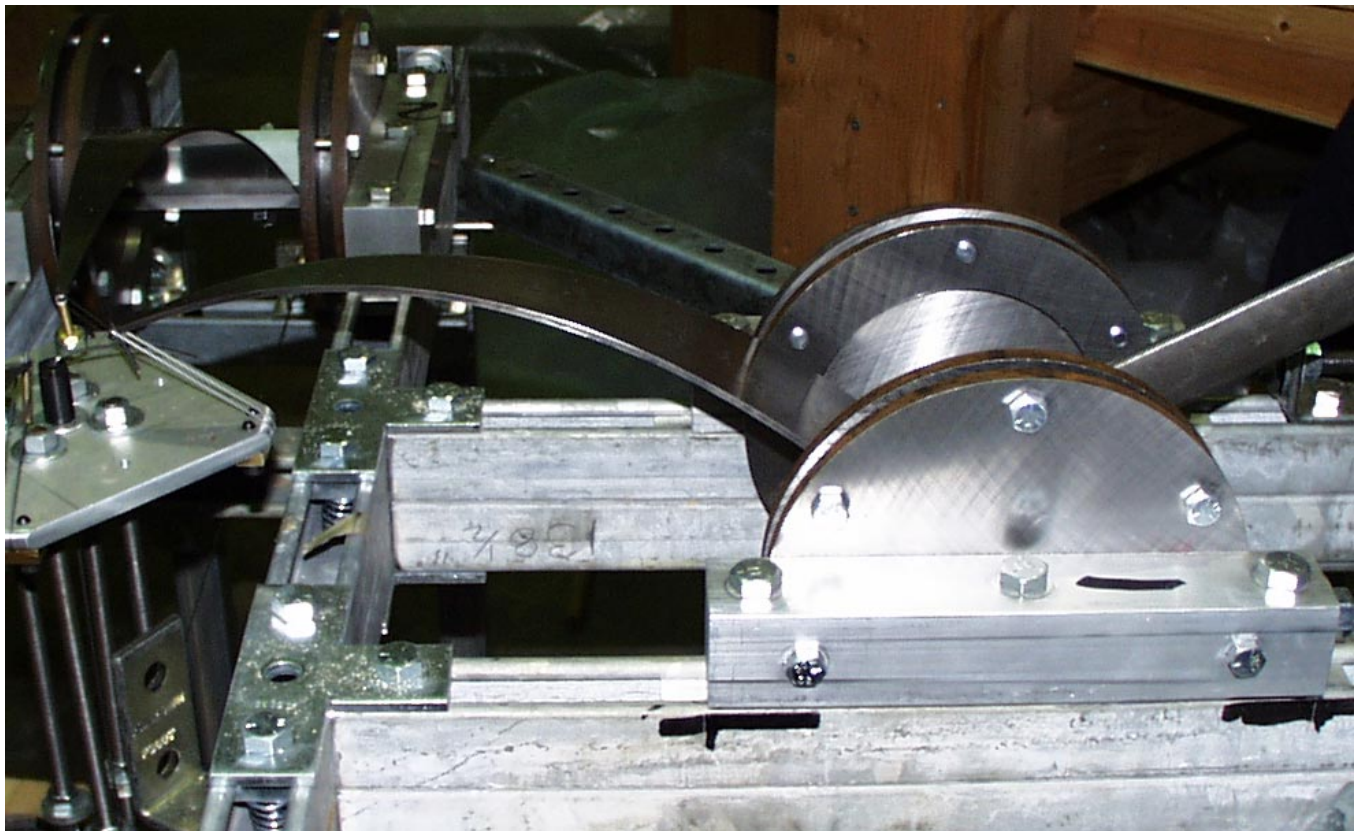
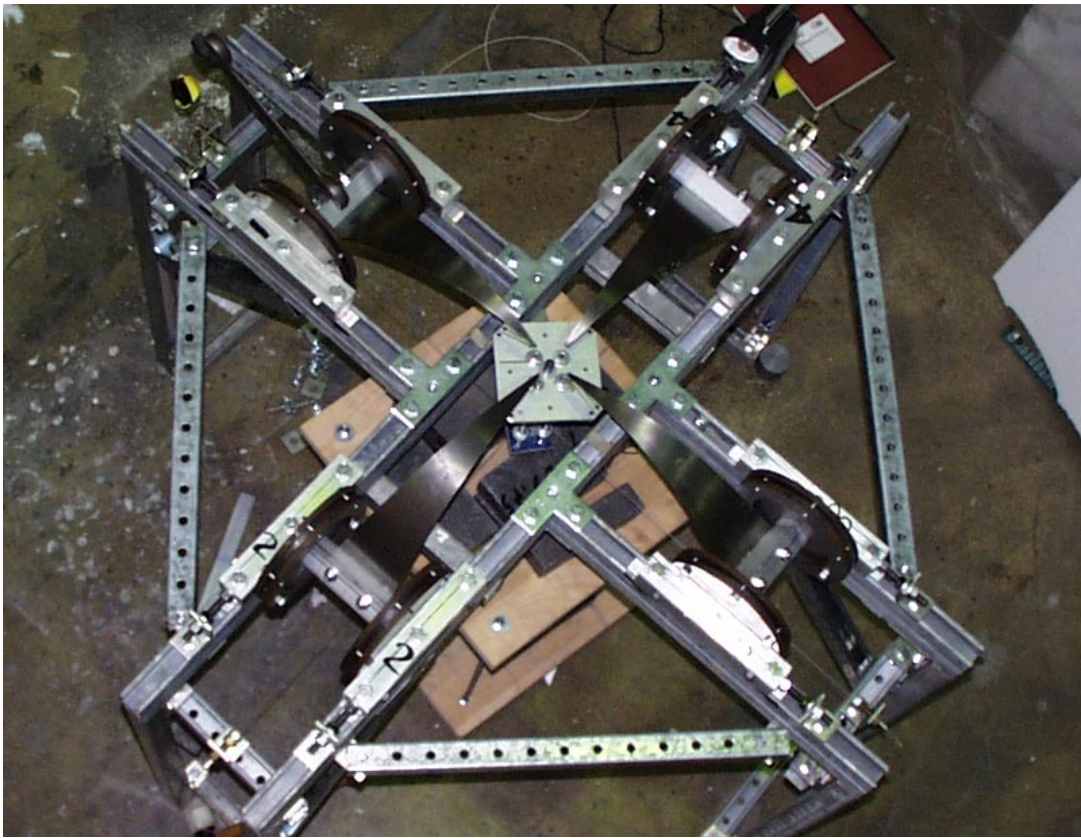
- Vertical resonant frequency versus payload vertical position y .
- Each curve corresponds to a different x coordinate



Unistrut Filter Prototype: Setup

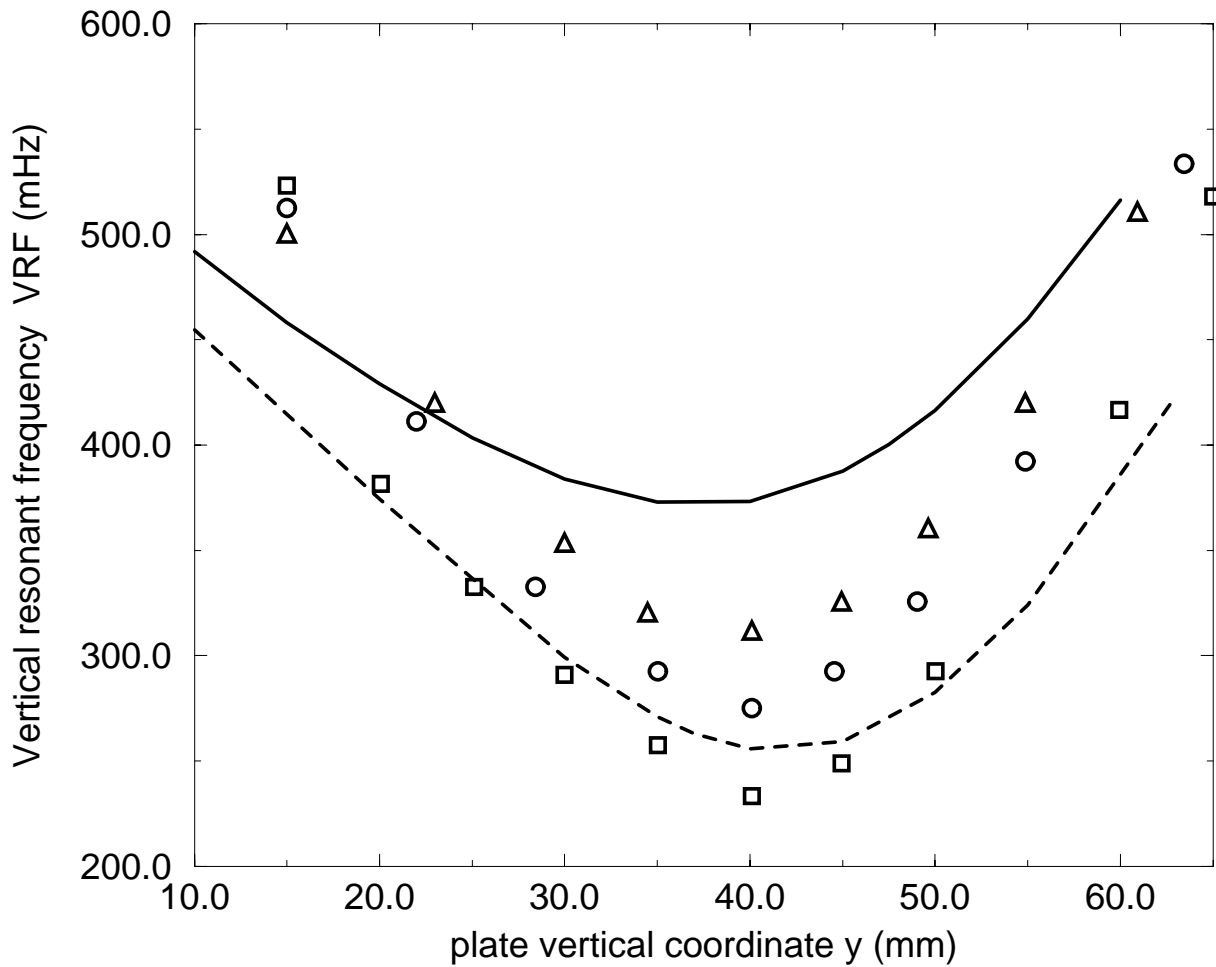


Unistrut Filter Prototype

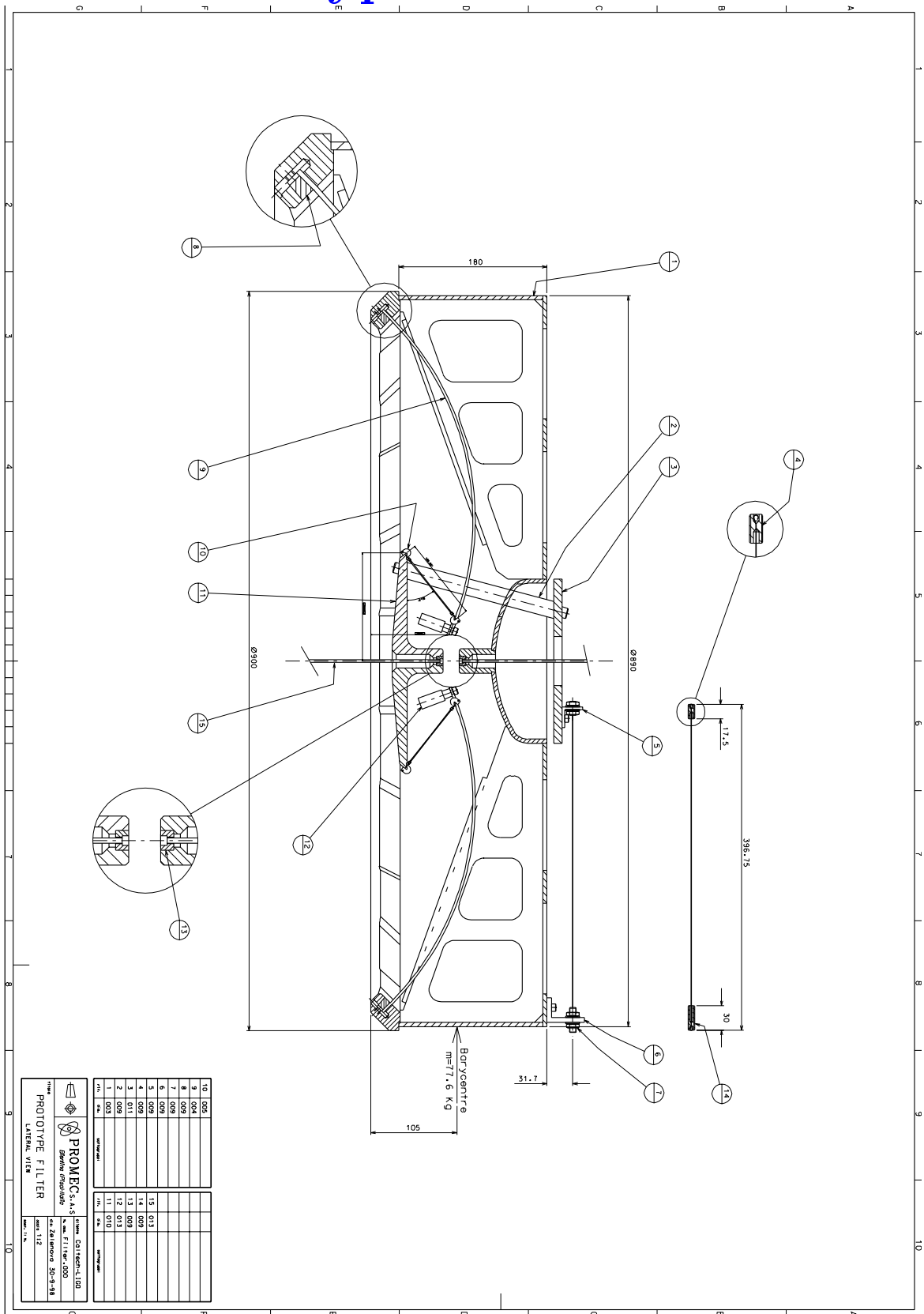


Unistrut Filter Prototype

(Vertical Resonance versus Plate Height)



Filter Prototype: Side View Section



NO.	QTY	DESCRIPTION	UNIT	REMARKS
10	050			
9	050			
8	050			
7	050			
6	050			
5	050			
4	050			
3	010			
2	010			
1	050			
12	010			
11	010			
10	010			
9	010			
8	010			
7	010			
6	010			
5	010			
4	010			
3	010			
2	010			
1	010			

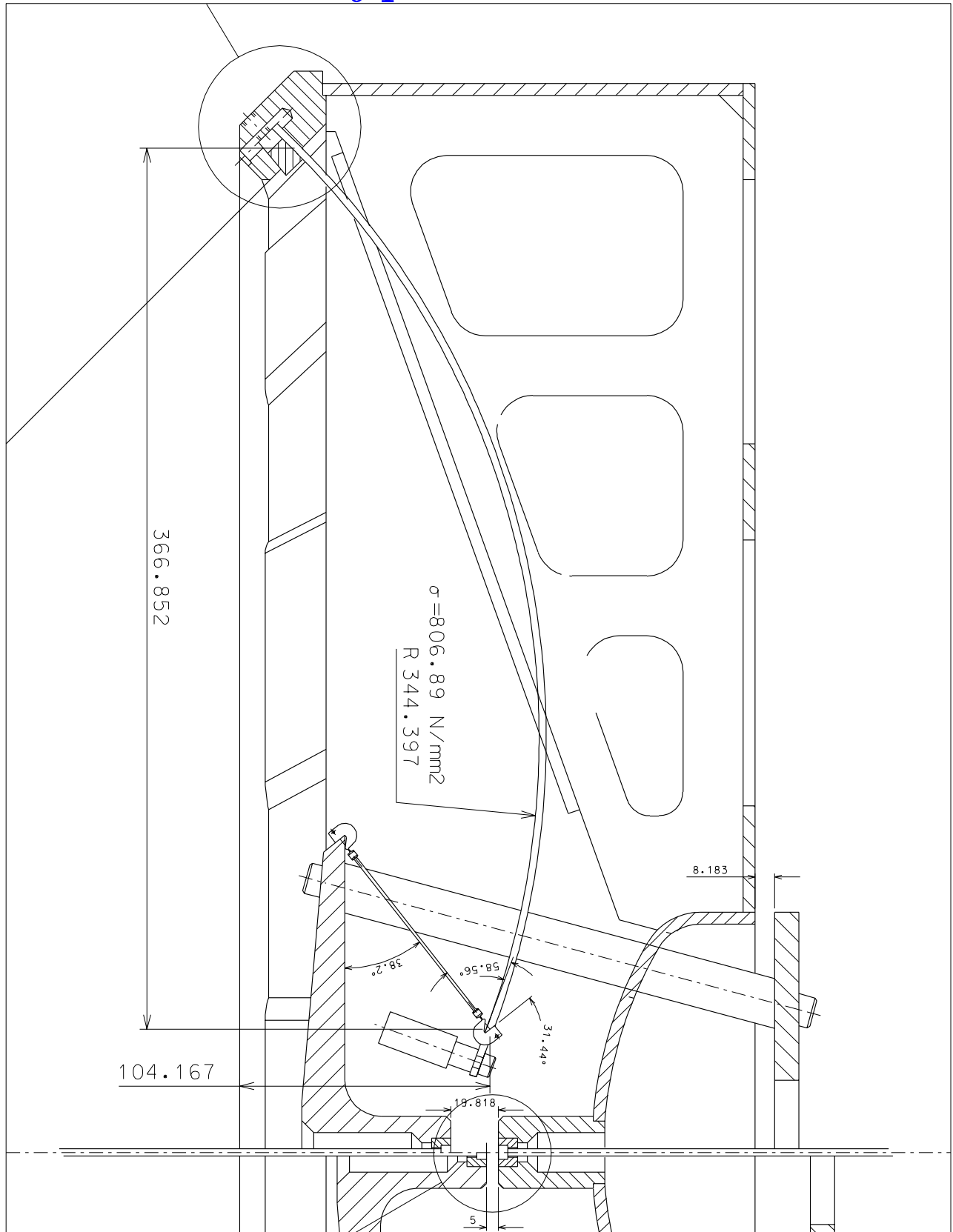
PROMEC S.p.A.
 Via F.lli - 1000
 40138 Zelandino 30-3-98
 Tel. 059 2112
 Fax 059 2112

Title: **PROTOTYPE FILTER**
 Drawing No.: **30-3-98**
 Date: **11/2**
 Scale: **1:1**

Author: **COLIN...**
 Checked: **...**
 Date: **...**

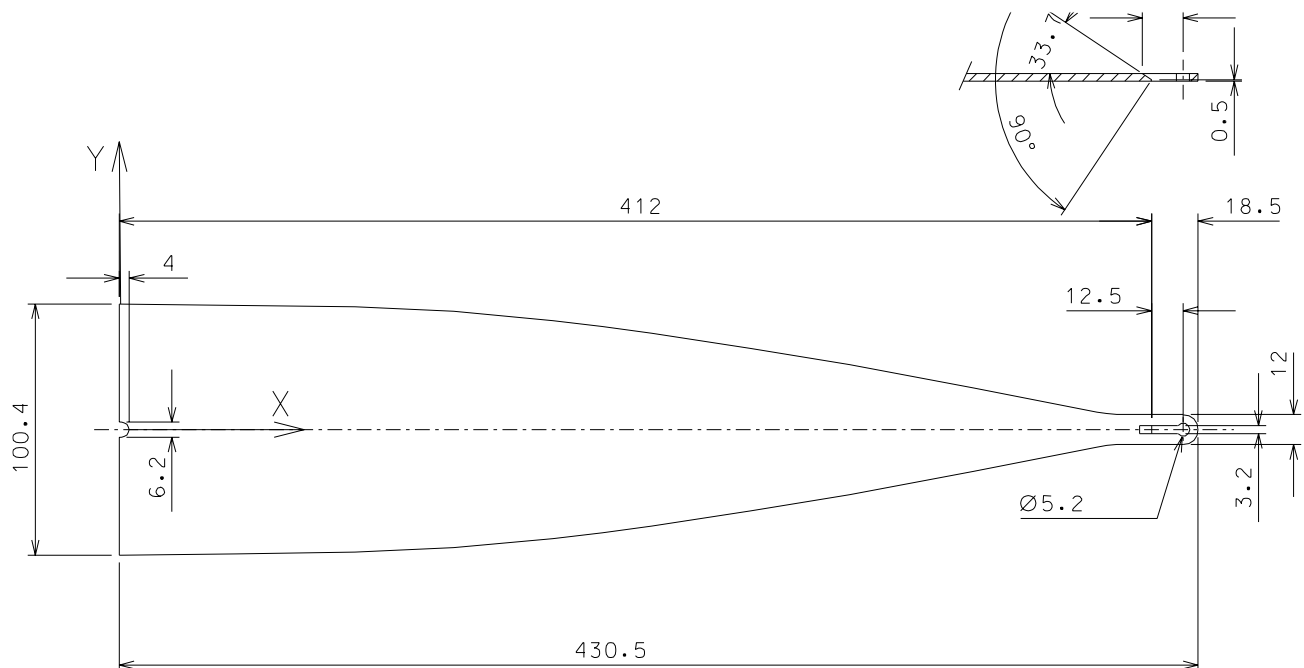
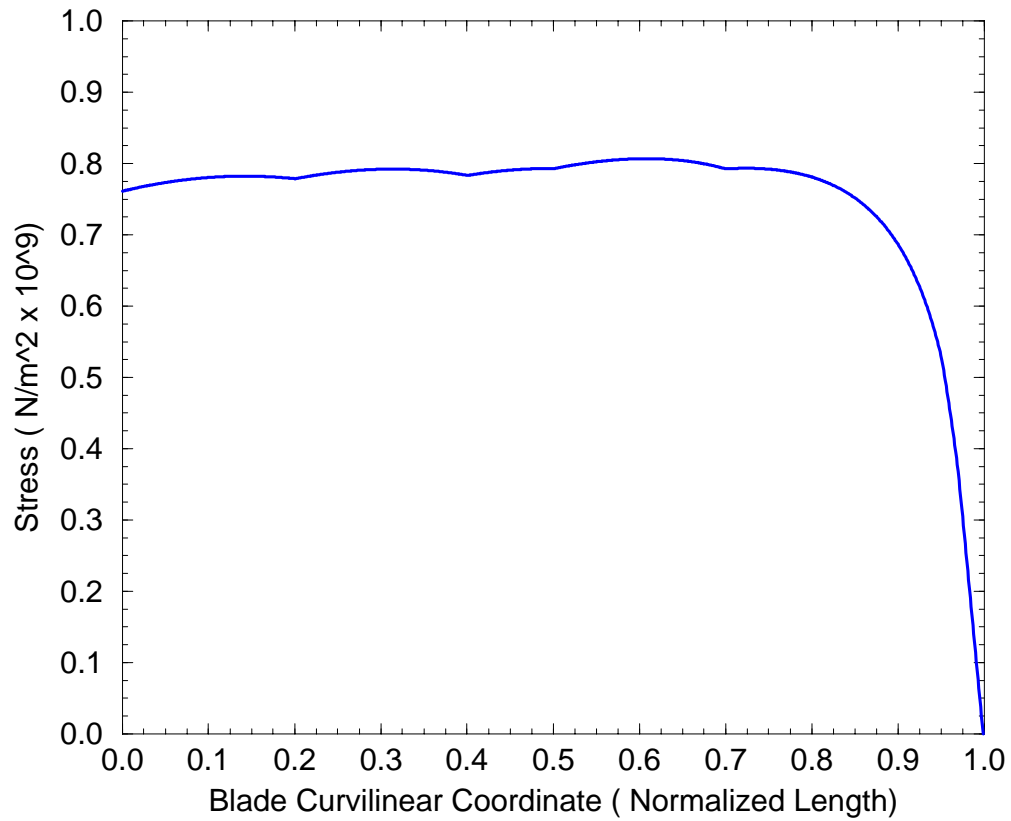
Filter Prototype: Side View Section

c:/ustation/dgn/md_draft/ligo/filt Dec. 2, 1998 23:43:30

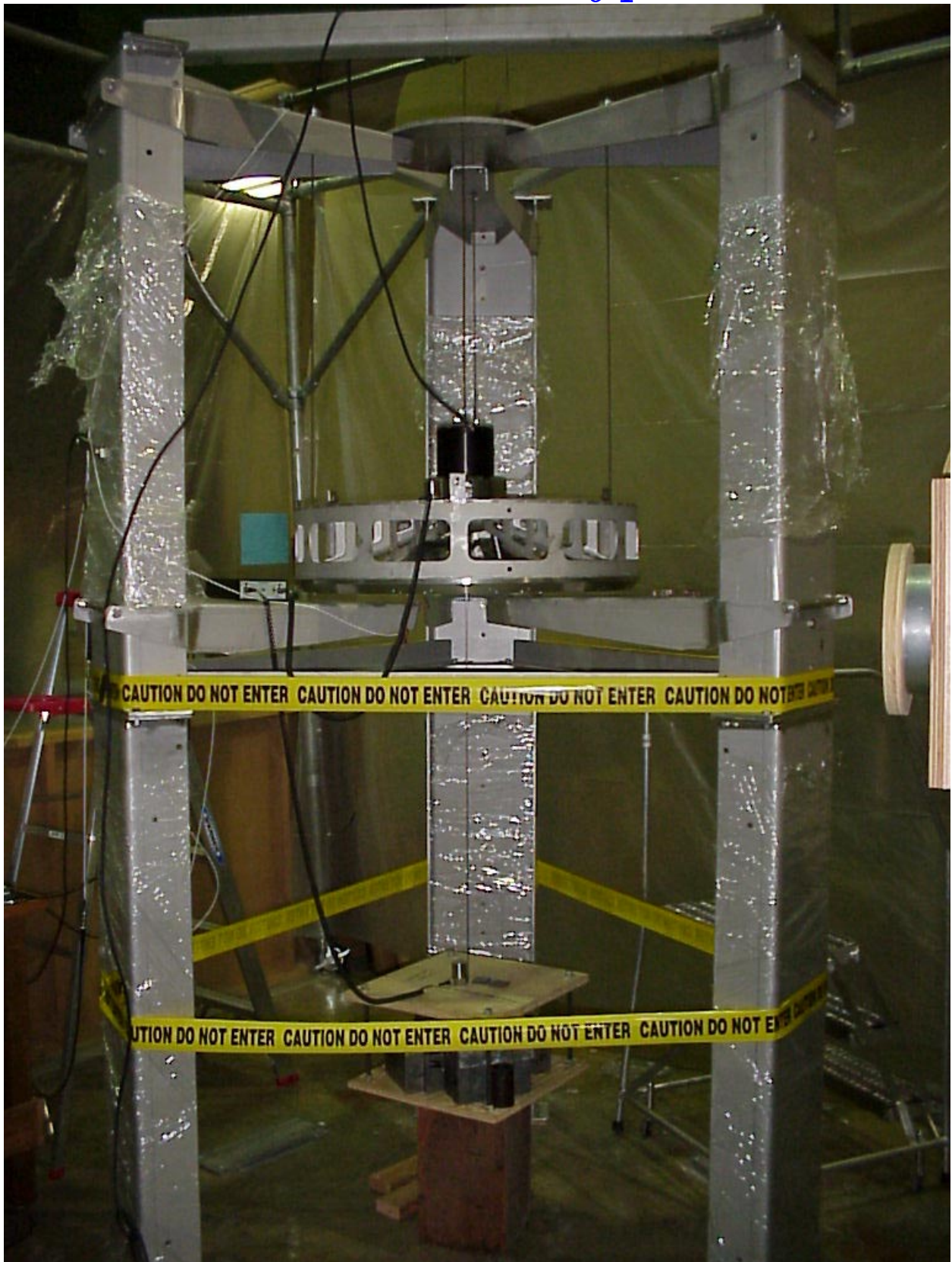


Filter Prototype: Blade Stress

(Almost Uniform Stress = Fat Blade)



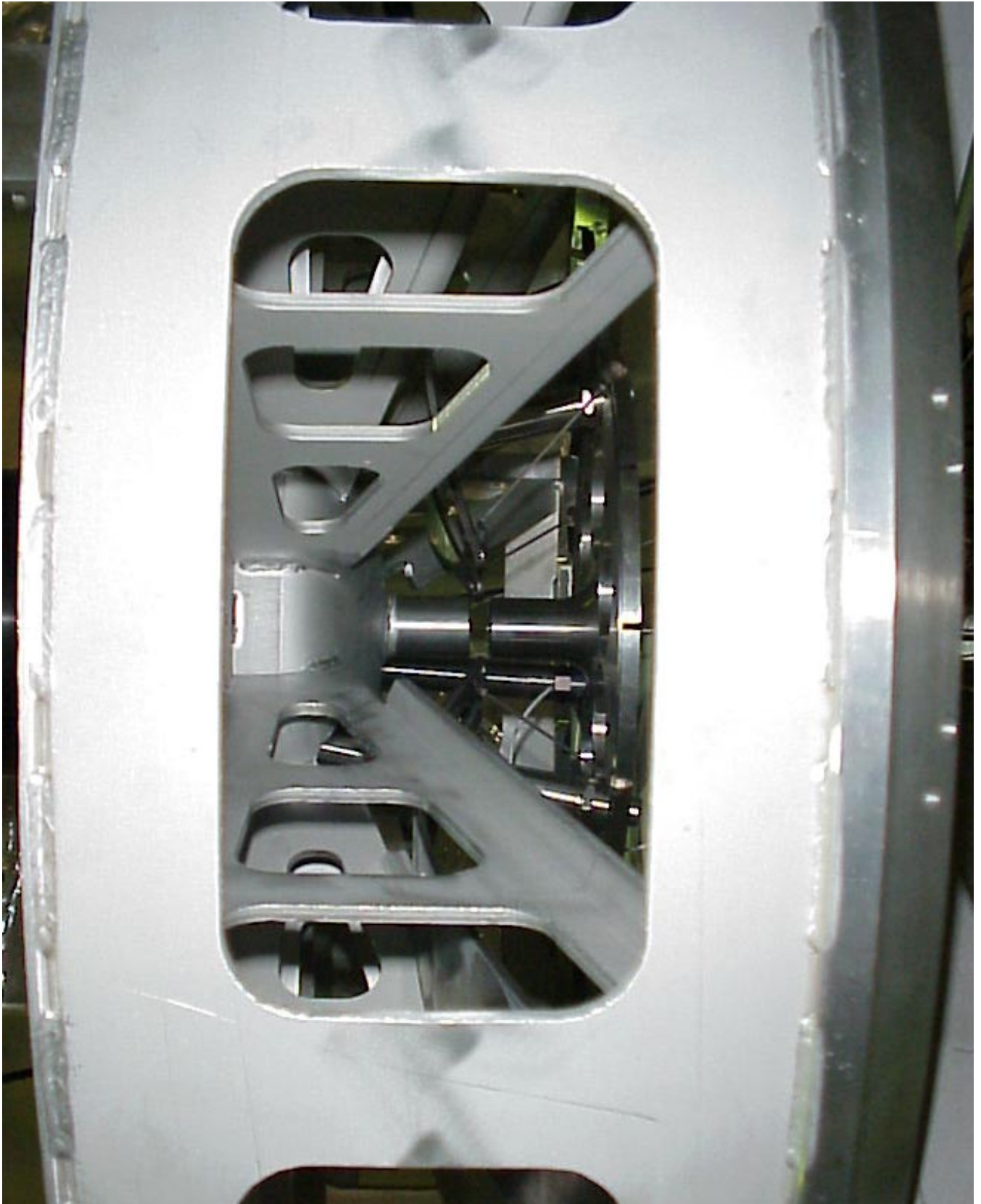
Filter Prototype



Filter Prototype

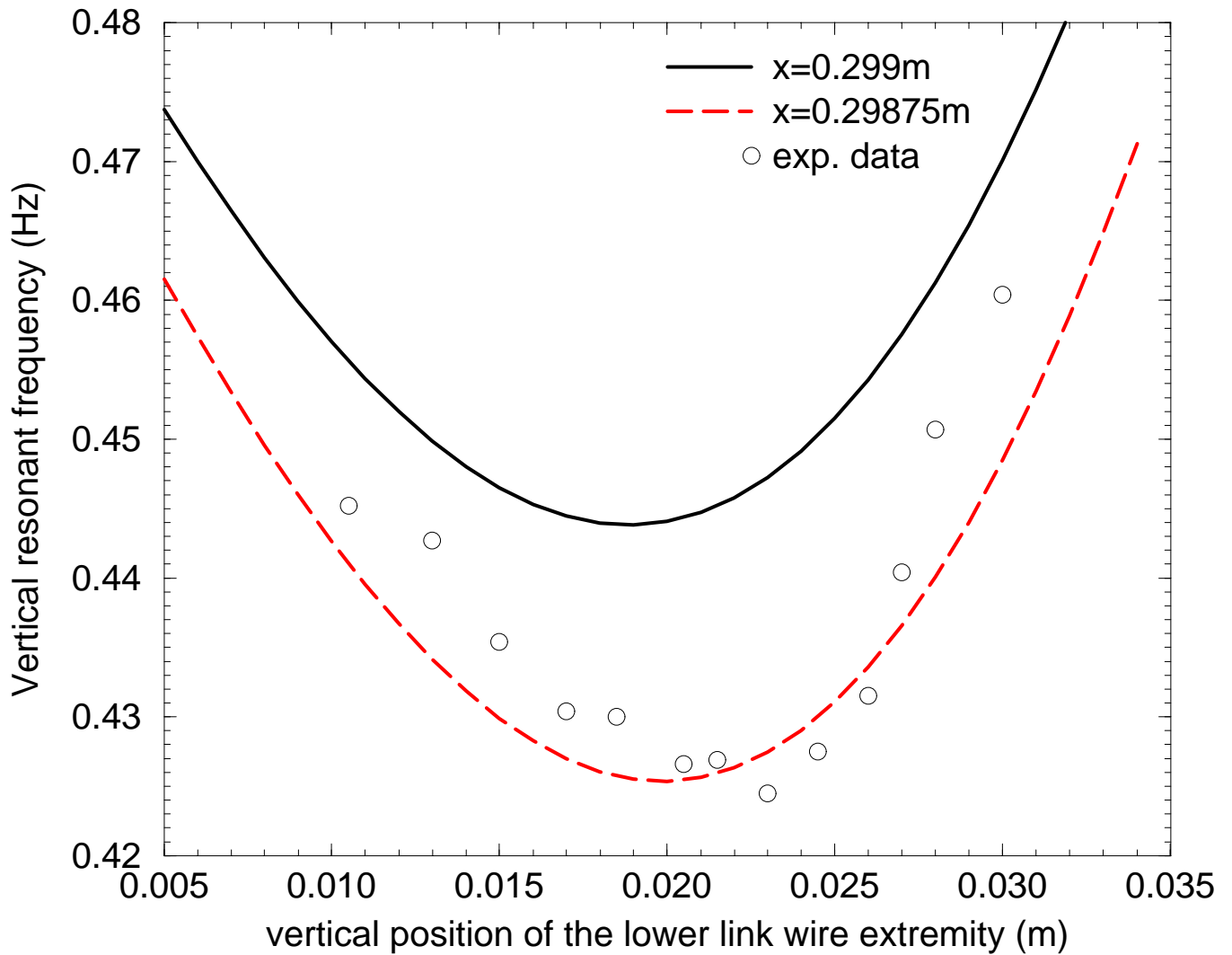


Filter Prototype



Filter Prototype : Vertical Resonance

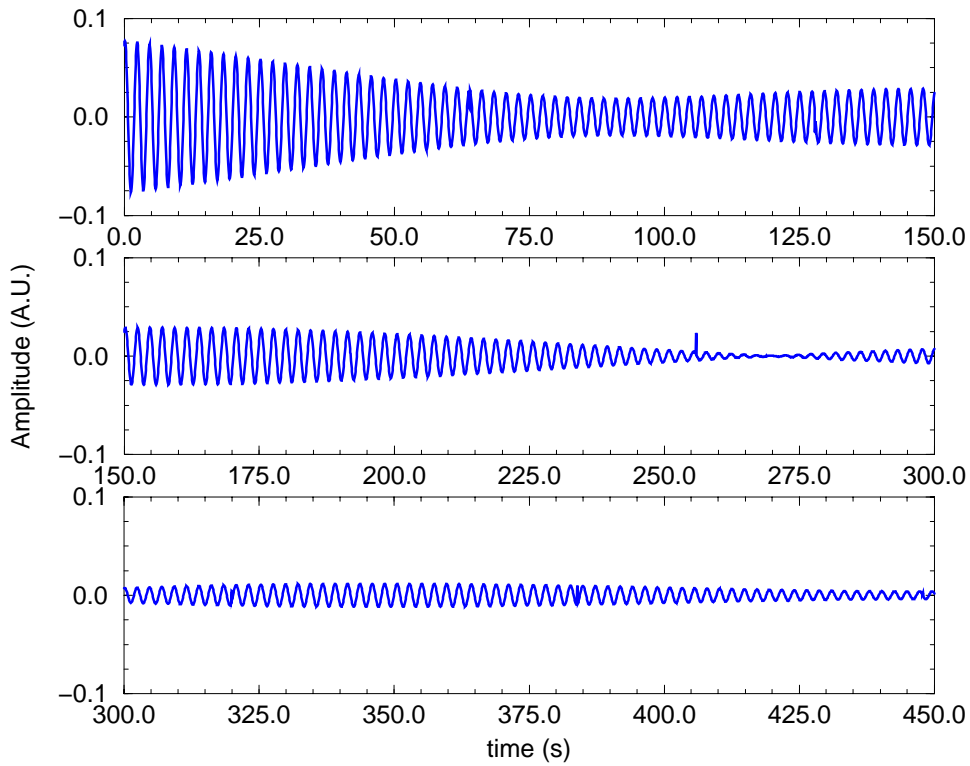
Vertical Resonant Frequency vs Vert. Position



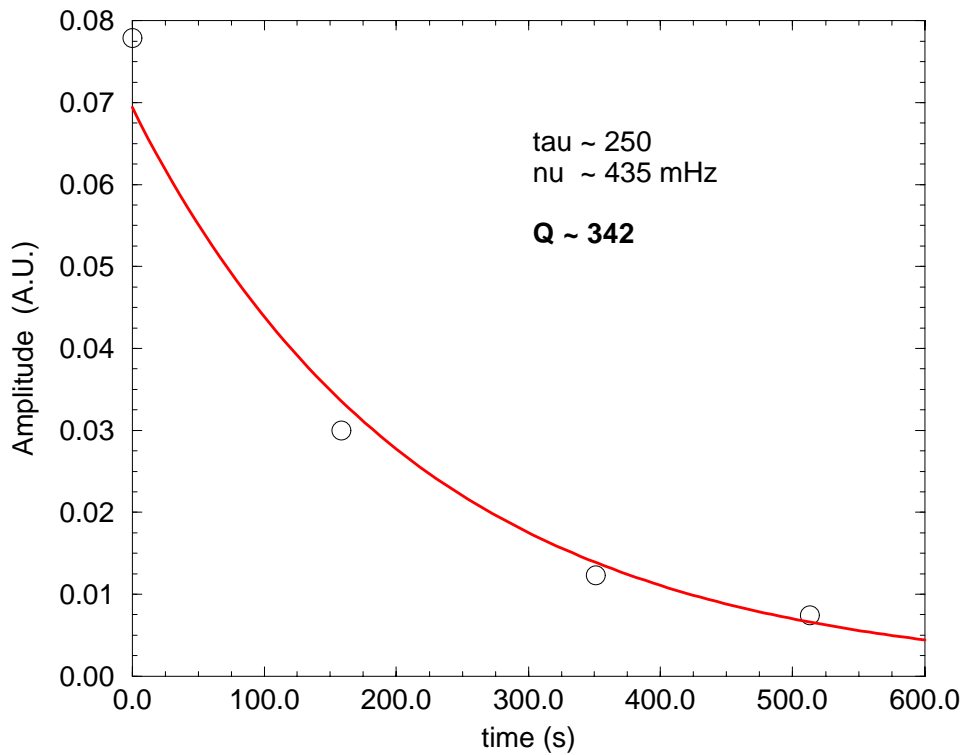
Filter Prototype

(Vertical Q Factor)

Free Vertical Oscillation

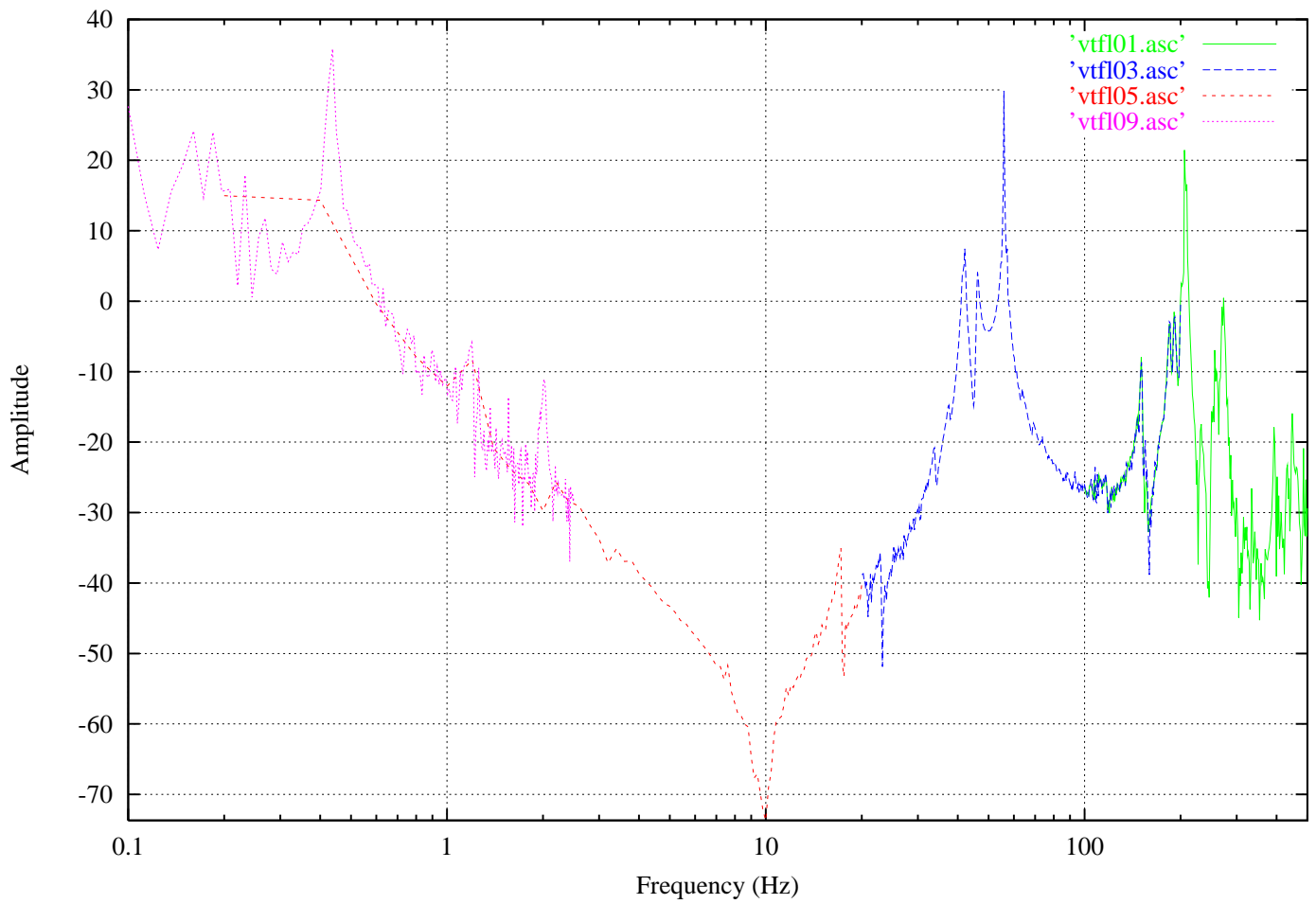


Vertical Resonance : Q factor Estimation



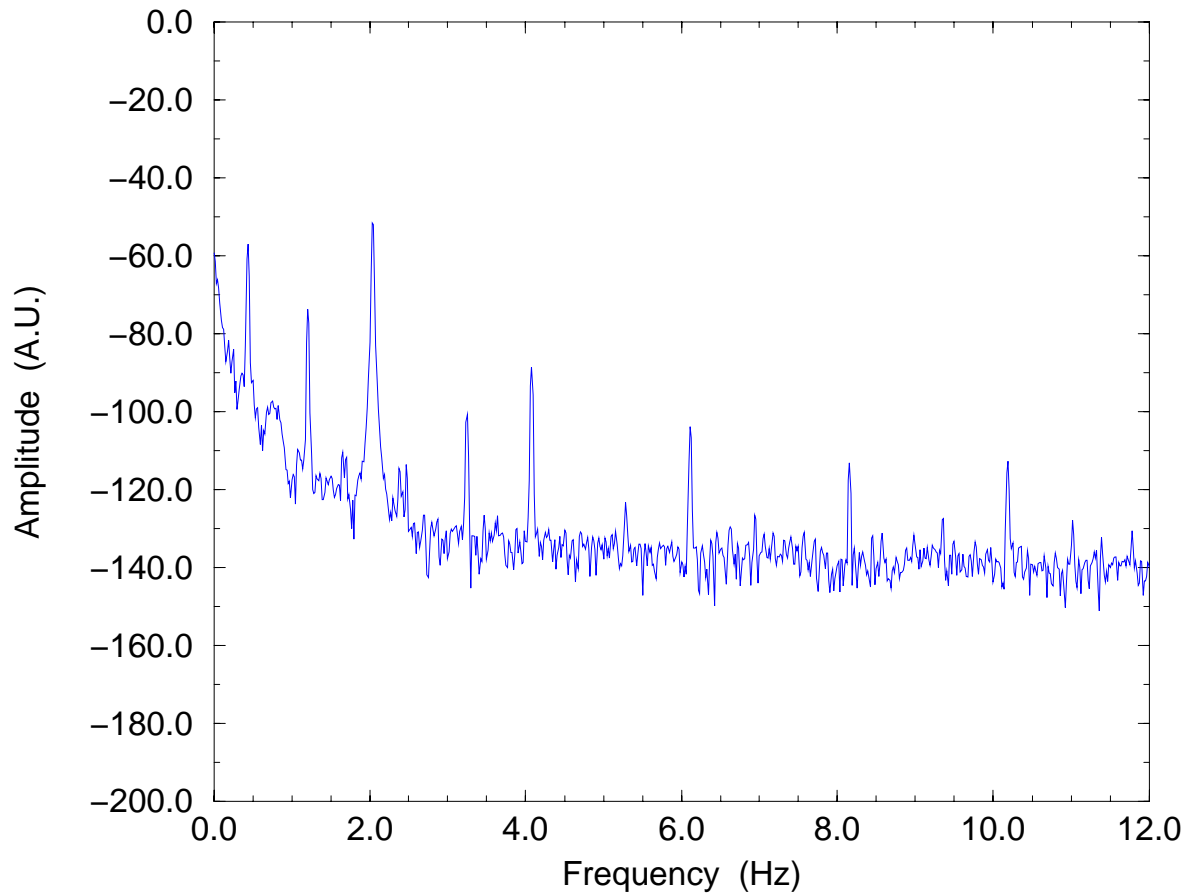
Filter Prototype: Prelim. Results

(Vertical Transfer Function)



Filter Prototype: Prelim. Results

(Power Spectrum of the Load)



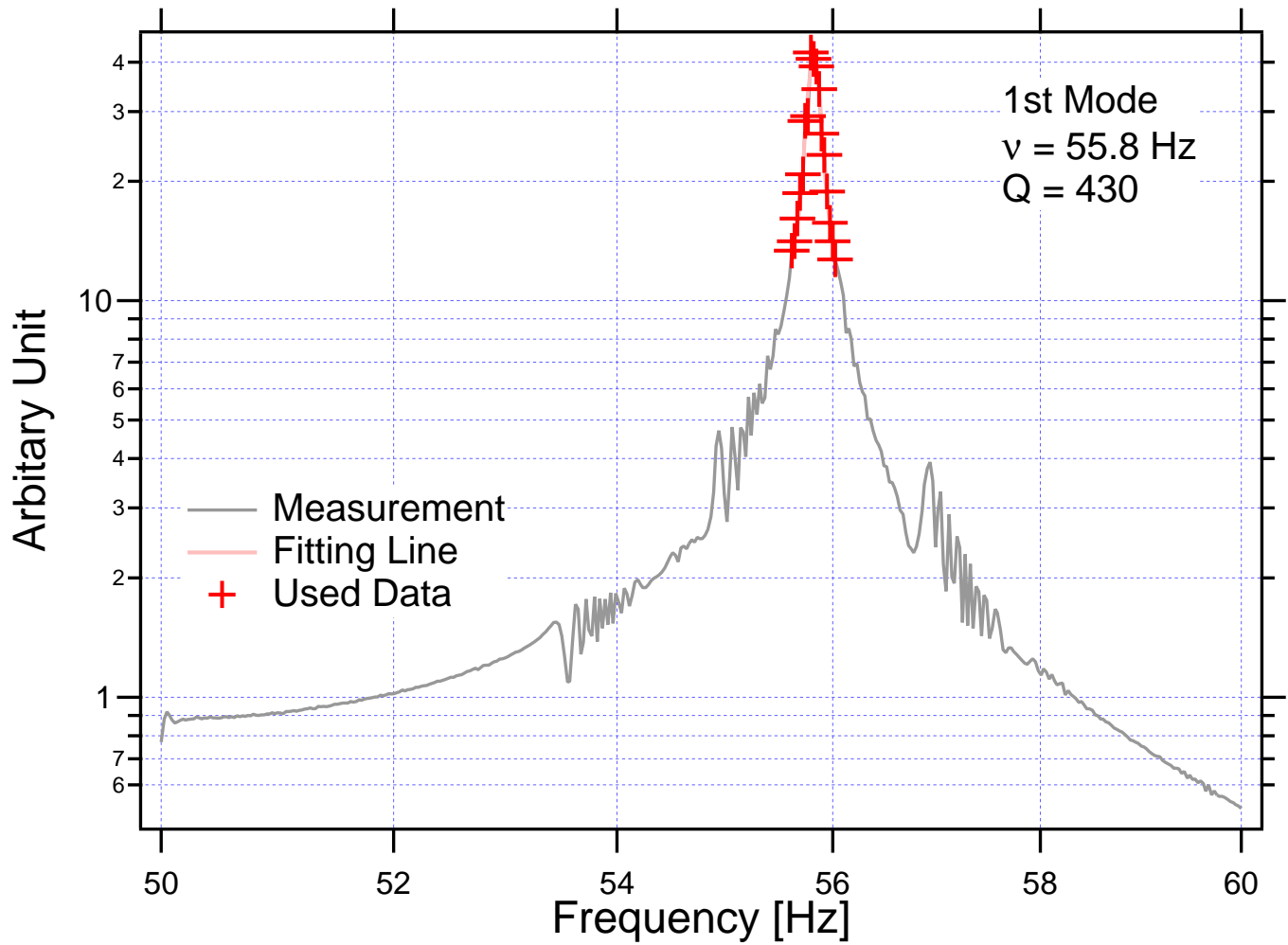
Filter Prototype

(Wood and Lead Made Load)



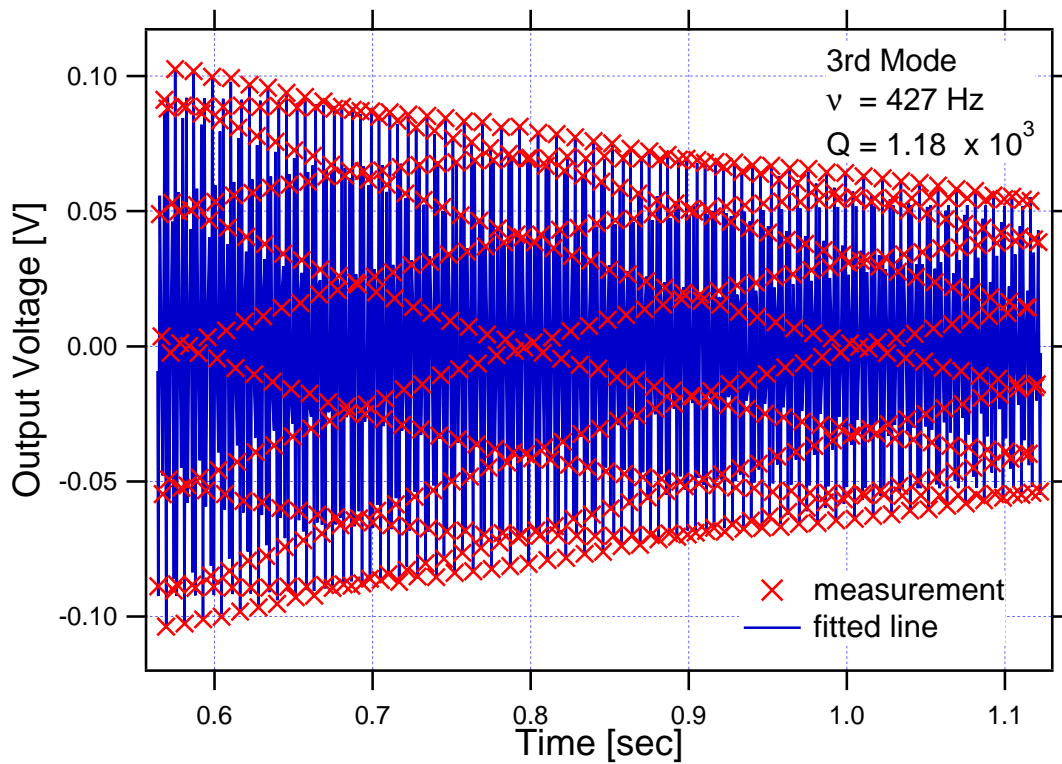
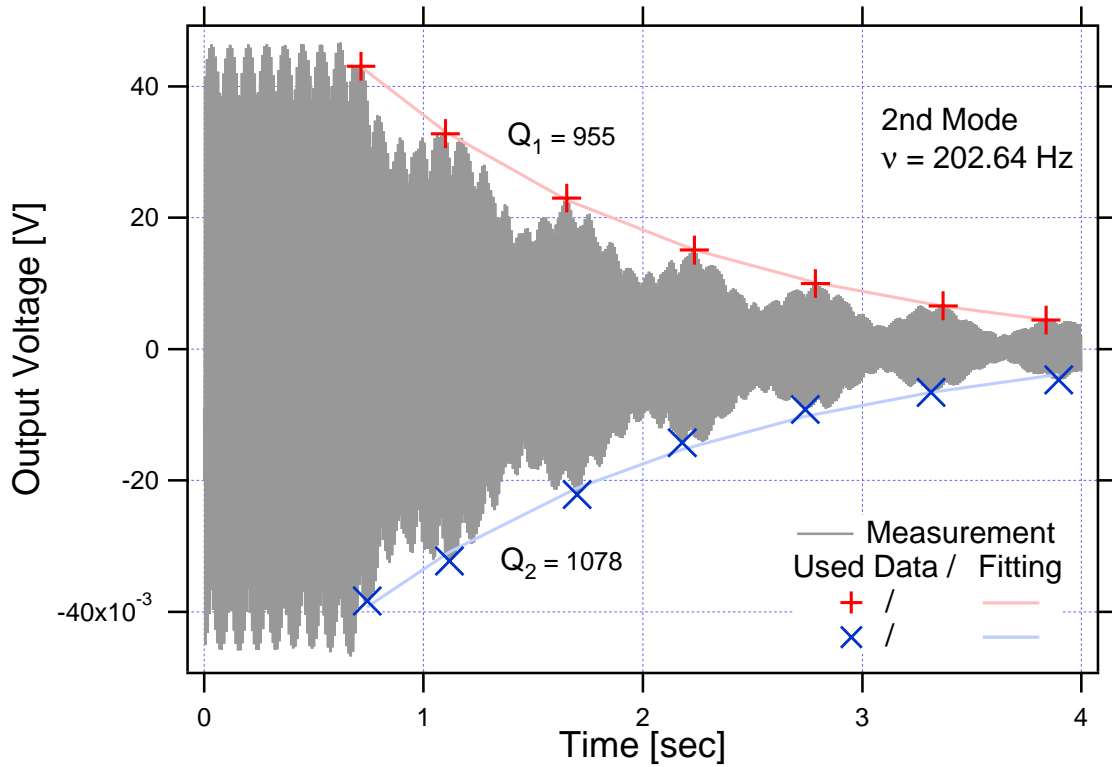
Blade Internal Modes

(Q factor Estimation, First Mode)



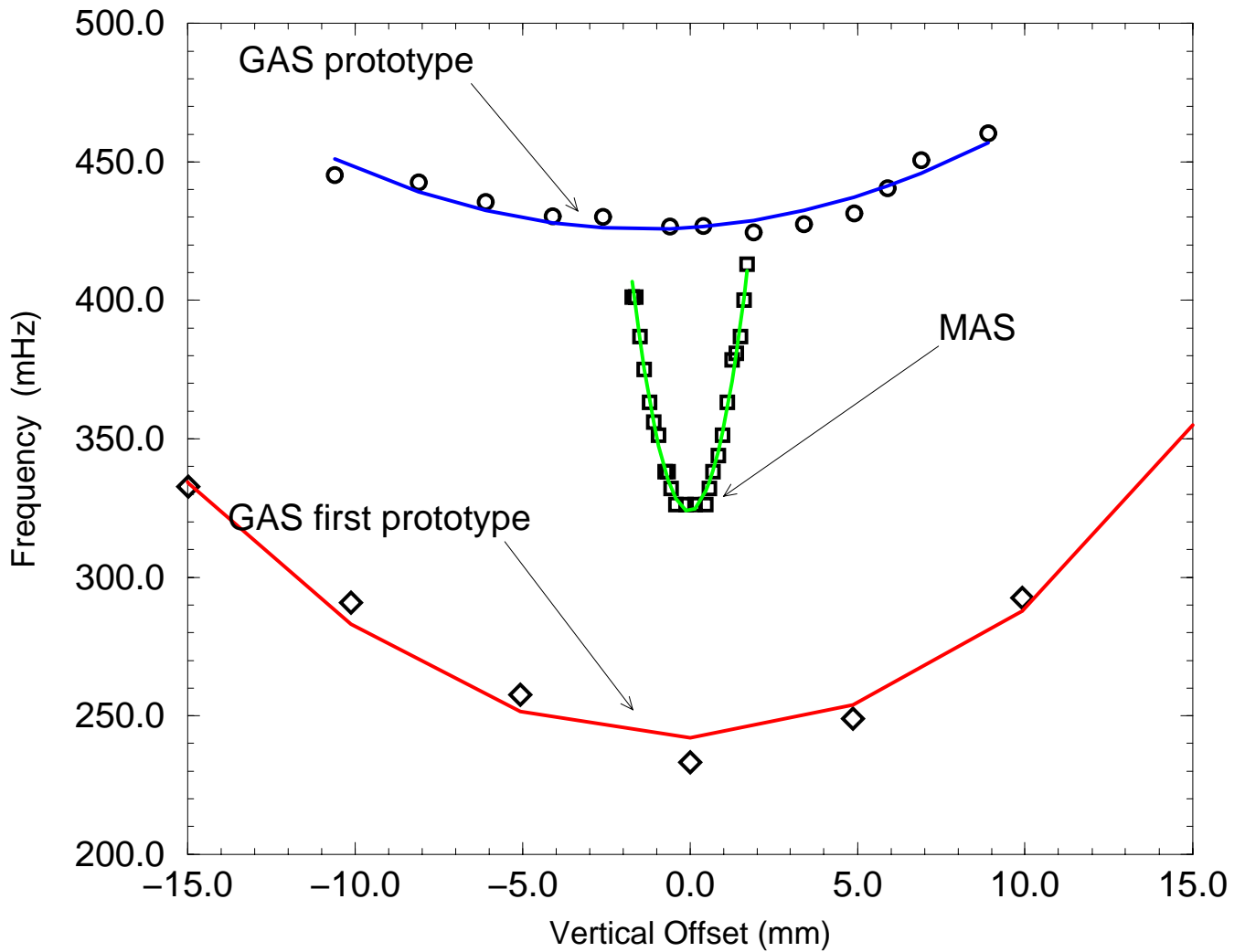
Blade Internal Modes

(Q factor Estimation, Second & Third Mode)



Vertical Frequency Tuning

(Comparison with Magnetic Anti-Spring System)



The Other Components of the Crew



Giancarlo Cella (no picture available)