

The Stanford Engineering Test Facility

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- Intro to the Facility
- Plan for experiments

Test Facilities

The goal of the Engineering Test Facility (ETF):

- Experiment with ideas for seismic isolation/ mirror suspensions/ interferometer alignment and control.
- Provide a facility which is flexible, easy to use, with reasonable turnaround times for engineering prototypes.

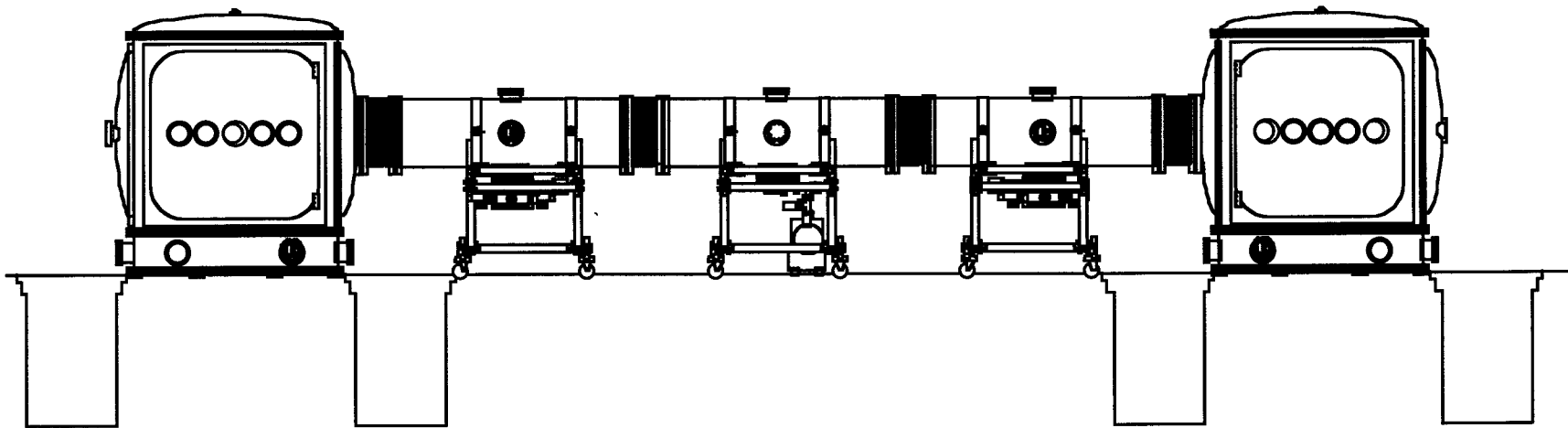
Large, flexible clean room (2,200 sq. ft. class ~1,000)
perform exps. in air, staging area for vacuum, other special projects

Additional lab space becomes available this summer.

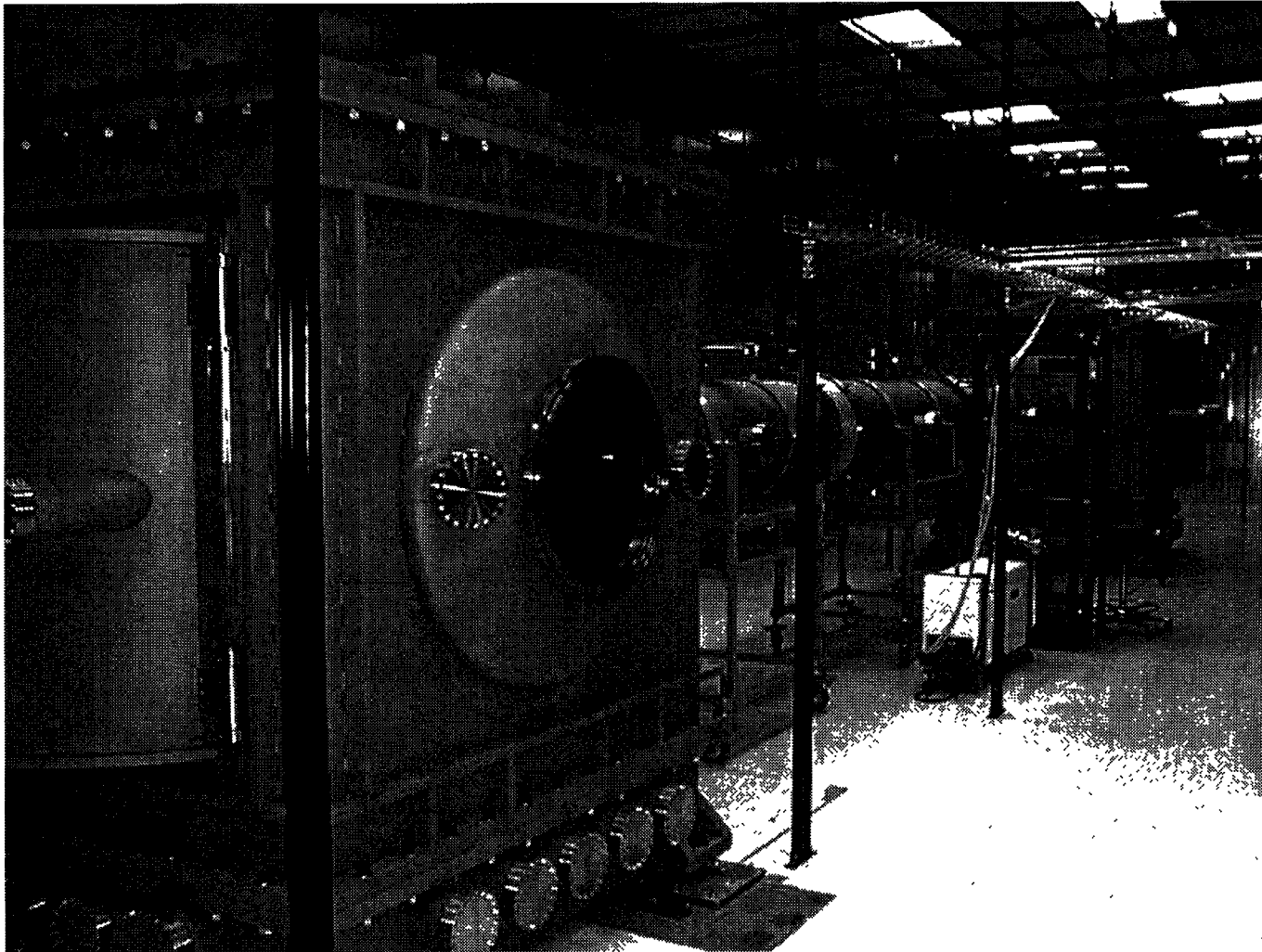
10 meter vacuum system with easy access.
(fully installed)

Vacuum System

- Ten meter system
- Reasonable chamber sizes (6' x 6' x 7'9")
- Hinged doors.
- Arm length access to entire chamber from the door.
- Rapid (1 day) vacuum system cycle time.



ETF Vacuum System



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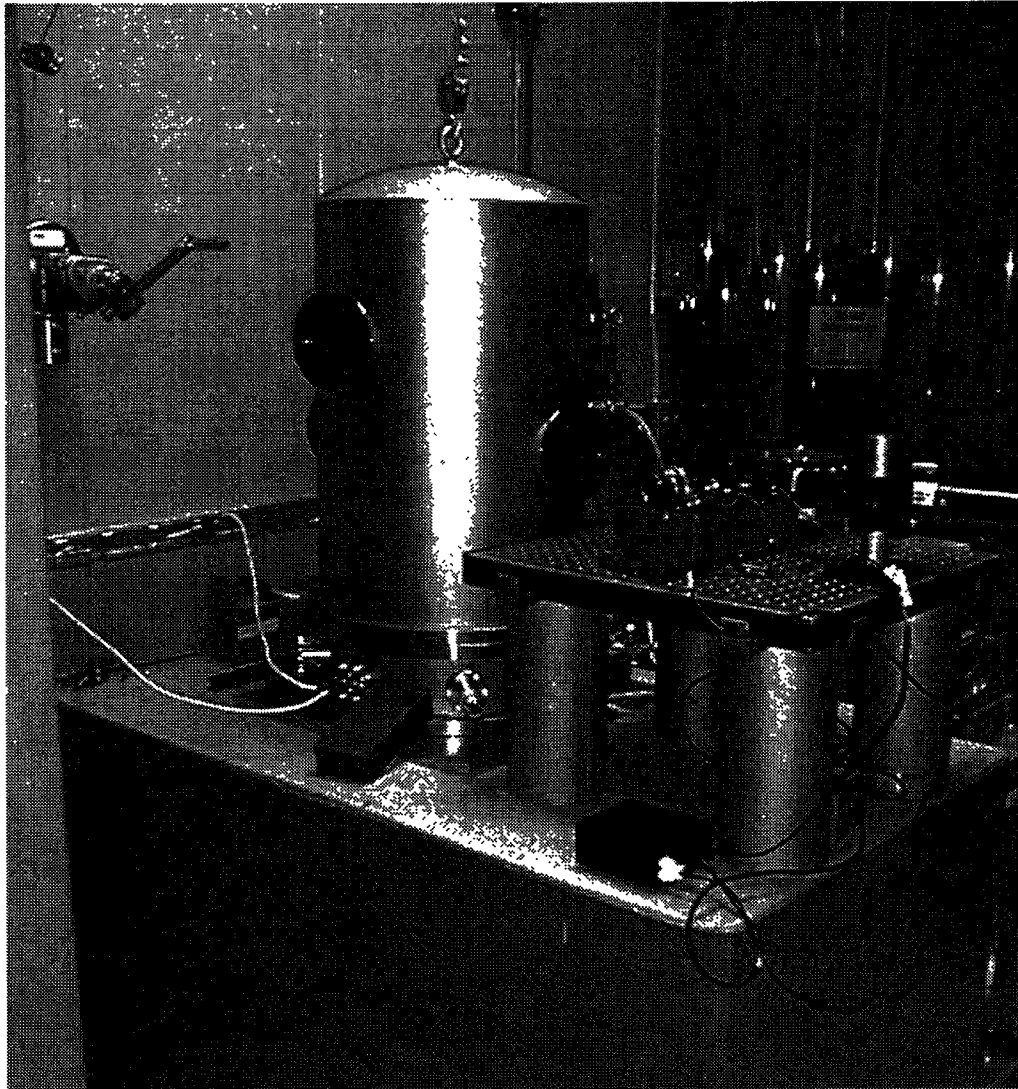
ETF Vacuum System



ETF Silicate Bonding Area



Testmass Ringdown Apparatus



Engineering Test Facility

Plan for Experiments

- Demonstrate the feasibility of active seismic isolation for LIGO IIa.
- Study issues of control reallocation.
- Focus on LIGO II issues, move away from LIGO III.
- Act as a user facility for other members of the Suspension and Isolation working group.

Schedule for Experiments

Now-Nov. '99: Control a table in 6DOF, in air.

Build a simple pendulum

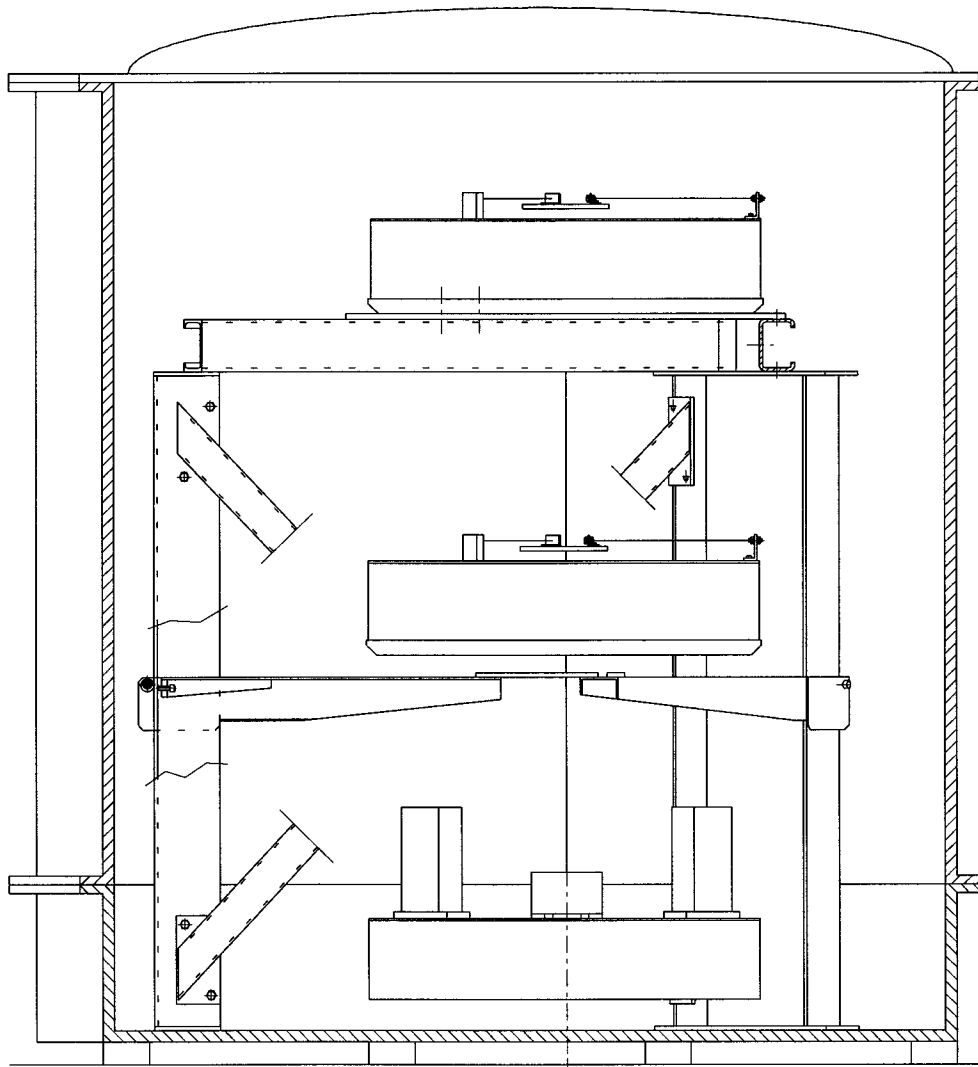
Build a stabilized laser

Dec '99-May '00: Put suspended Fabry-Perot interferometer into vacuum, test active platform with control reallocation. Work on issues of vacuum compatibility.

June '00-Dec. '00: Design a better LIGO-like active platform, and implement simple active control on it.

Fall '99: Host Riccardo DeSalvo et. al. for tests of improved seismometers in ETF vacuum system.

Whisker Diode Accelerometer



Insert two stages of Riccardo's passive isolation to provide a quiet platform to test accelerometer designs.

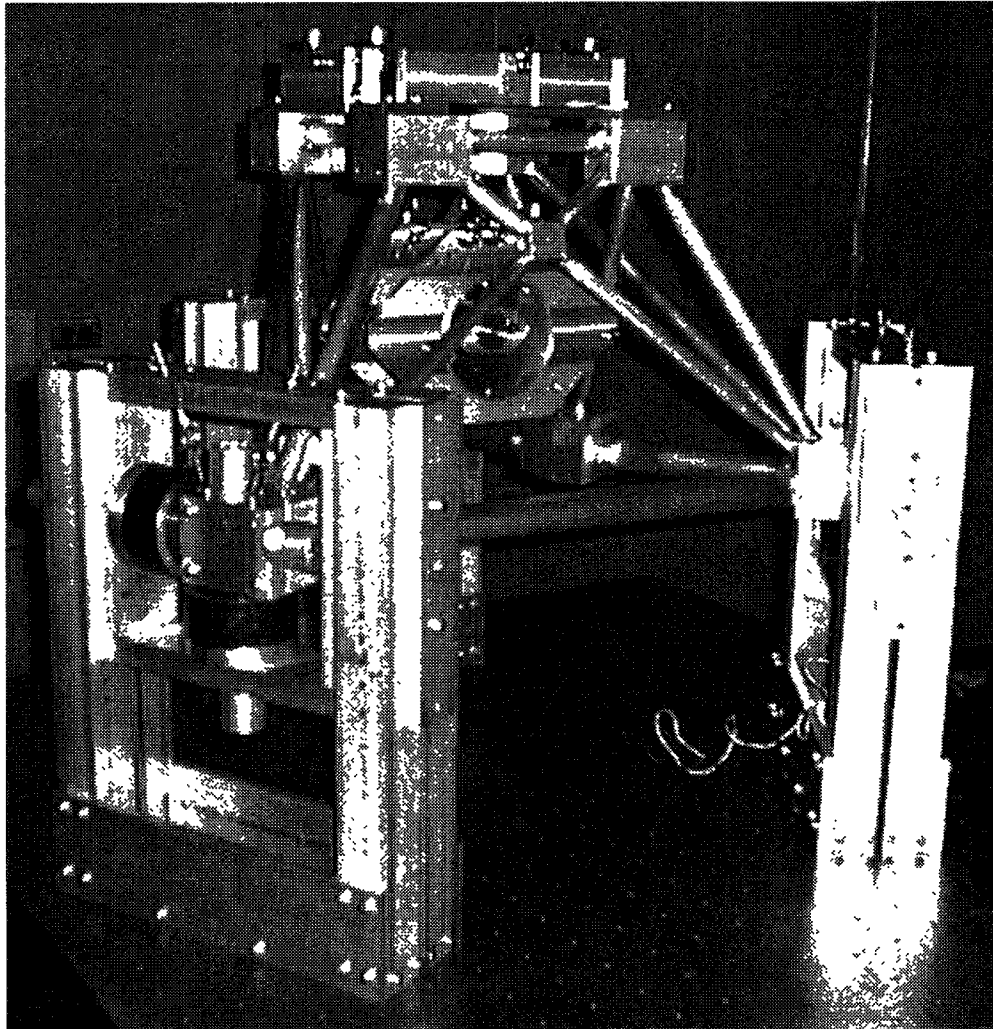
Allows a vacuum test of advanced accelerometer designs.

To be done this fall.

Riccardo
DeSalvo

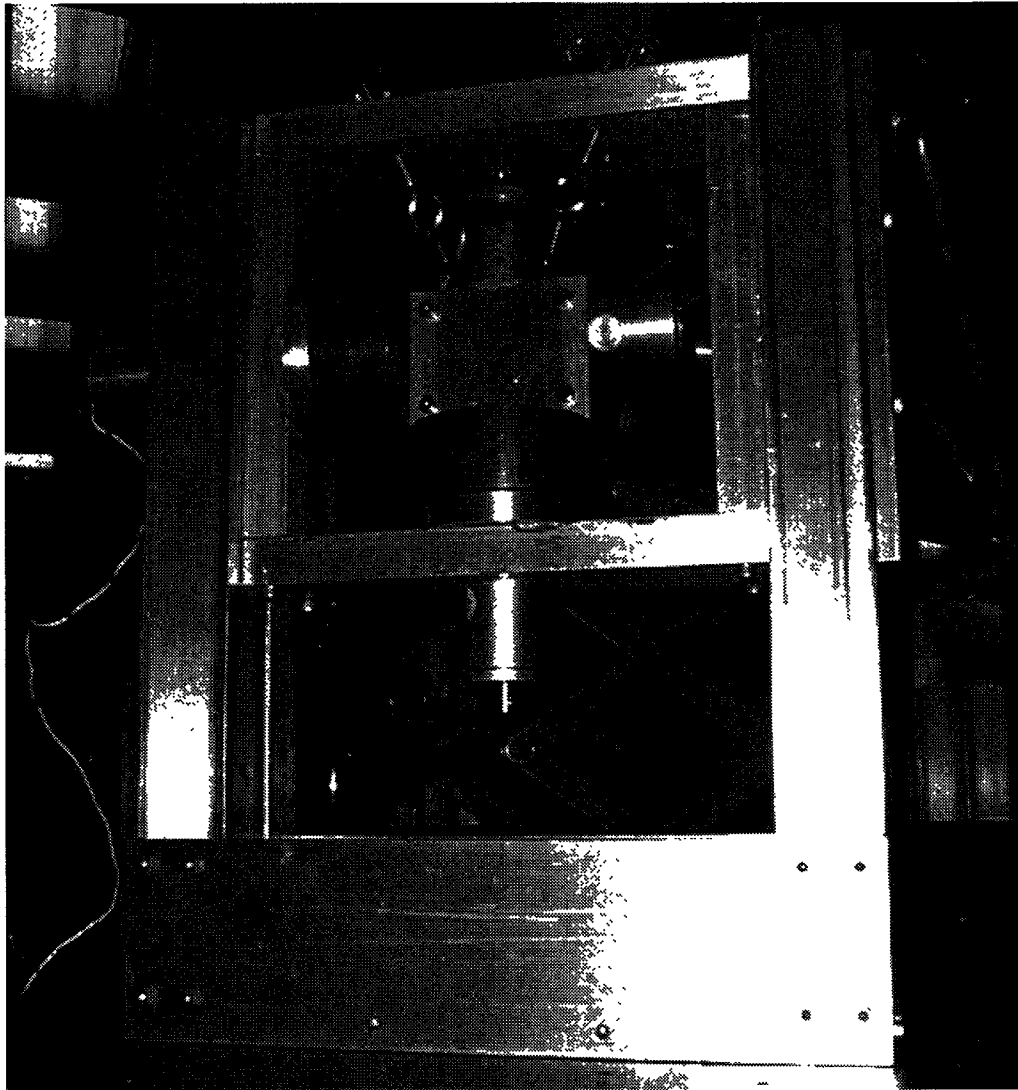
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6 DOF active platform



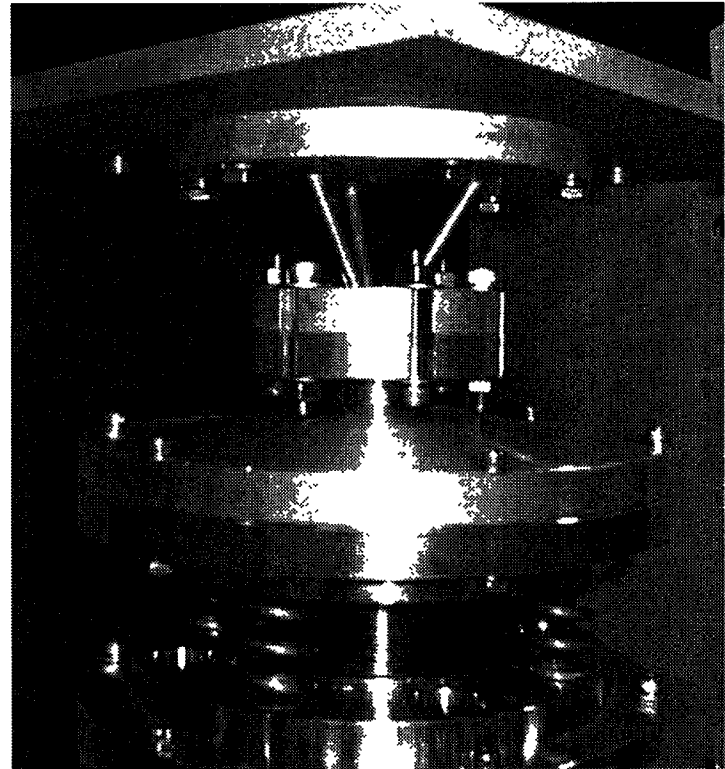
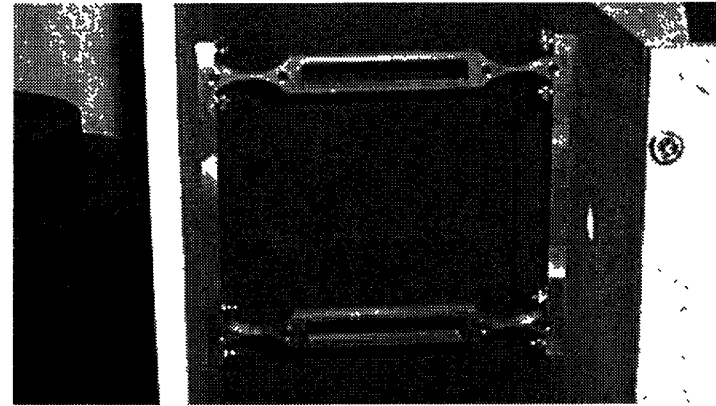
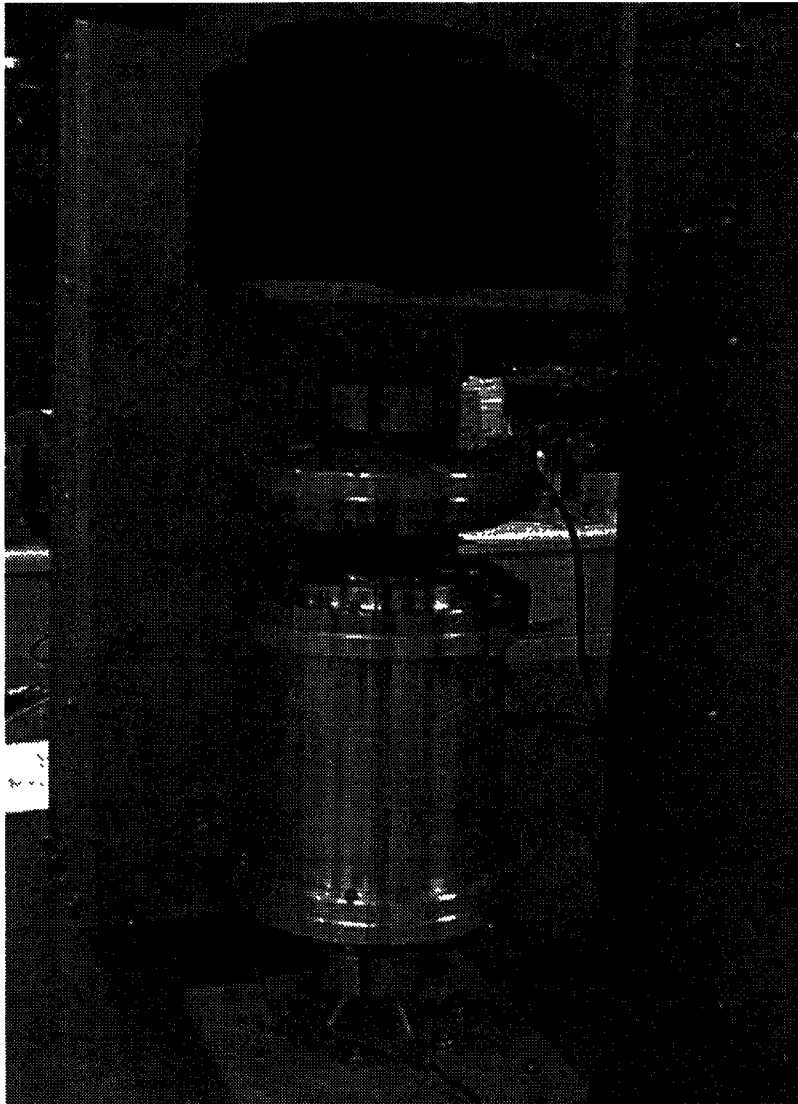
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2-D Active Strut



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1-D Active Strut



Final Remarks

- Our infrastructure is essentially complete.
- Lots of ideas about control, try them out so we can make the right choices for LIGO 2.
- ETF is a good facility - clean, spacious, and easy to use.