

# **Recent Work in Vibration Measurements at BNL**

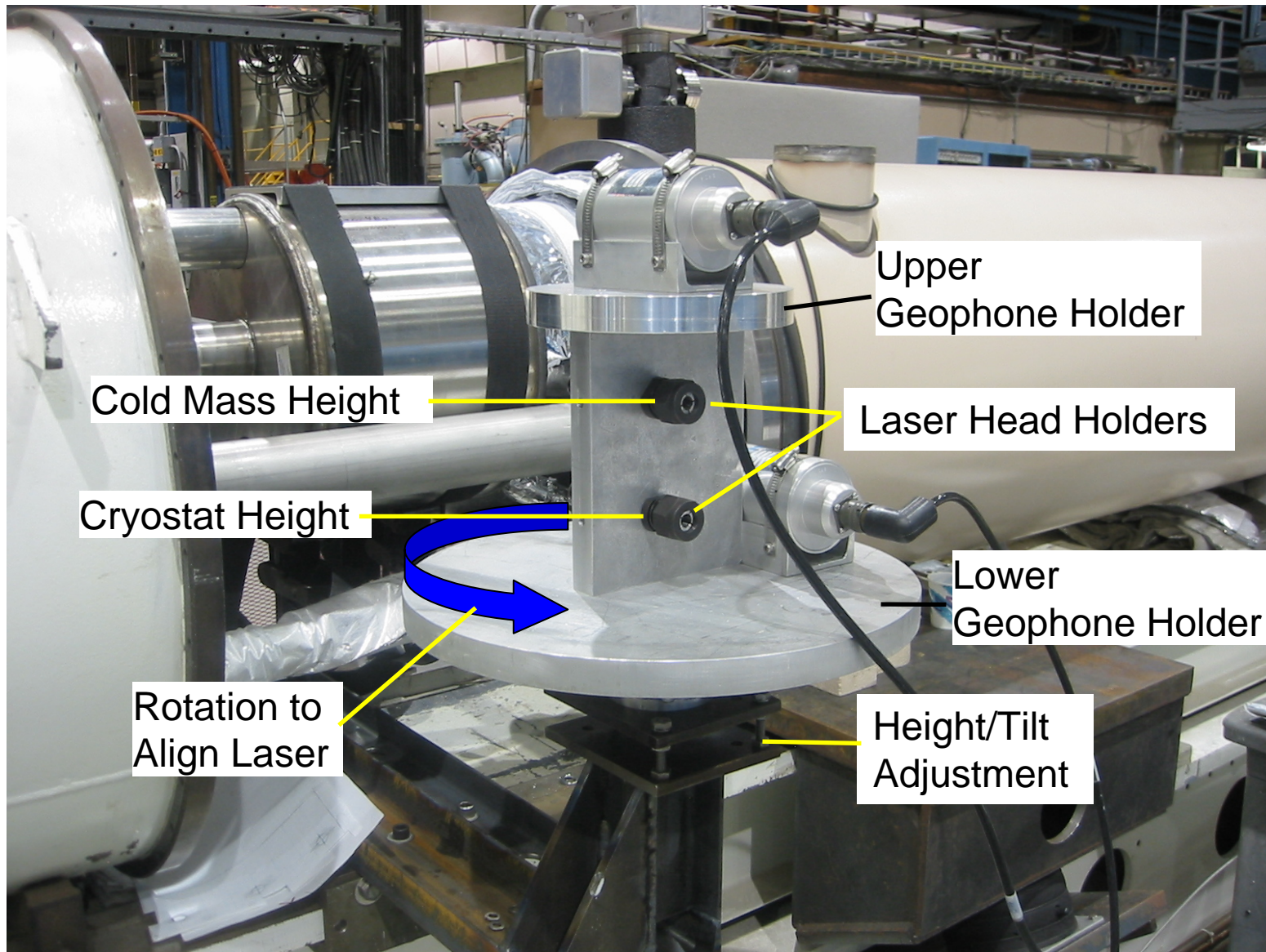
Superconducting Magnet Division, BNL

BNL-SLAC TeleConference: Feb. 7, 2005

# Recent Activities

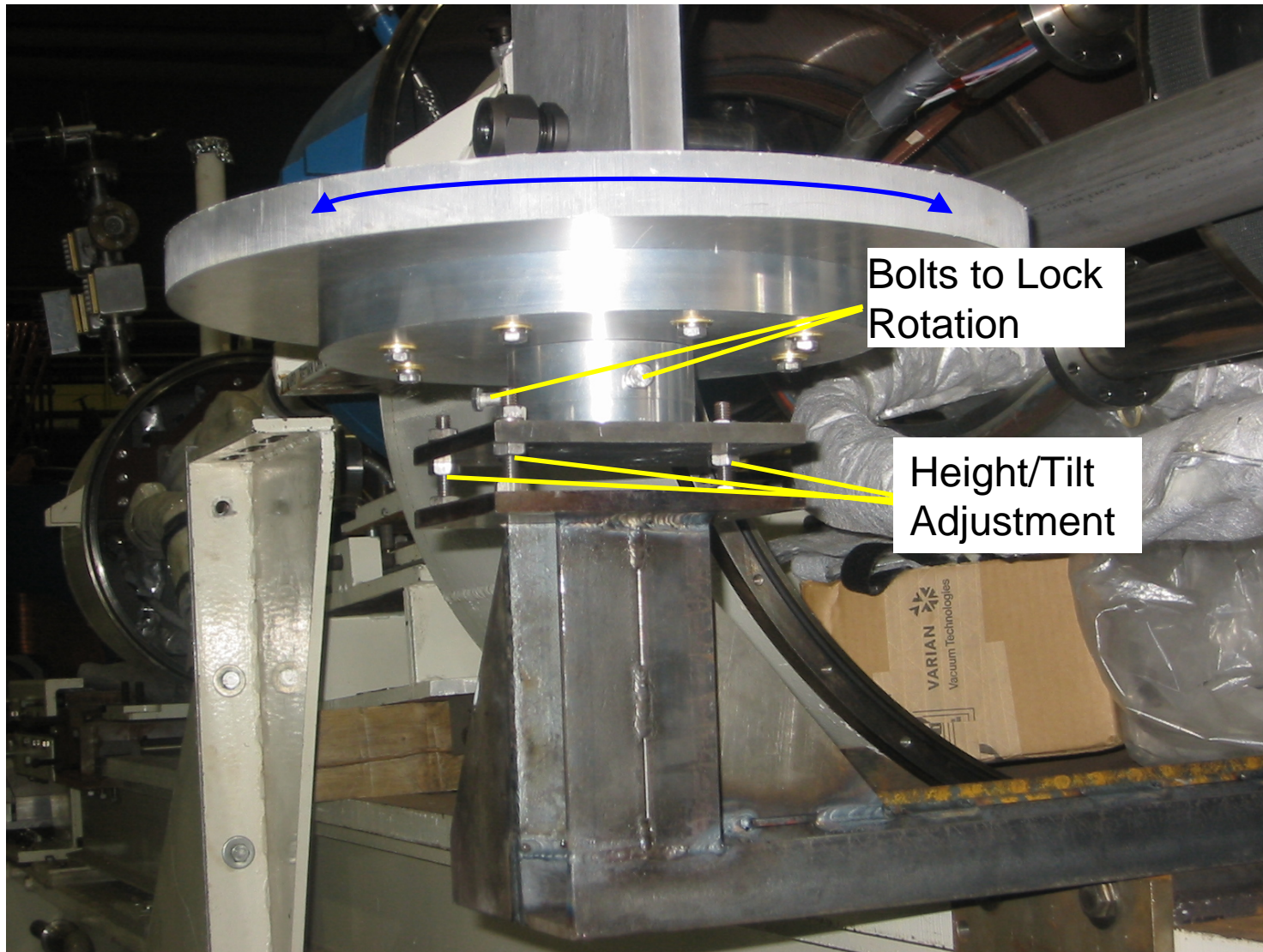
- Preparations are underway to carry out vibration measurements in a RHIC quadrupole using a laser vibrometer.
- Use of a dual-head vibrometer is planned to mitigate effects of laser head motion.
- A fixture is designed and built to mount the fiber-optic laser heads on the cold test stand.
- Vibration characteristics of the fixture are being studied using geophones.
- A visit to PolyTec Inc. will be undertaken in the near future to gain some experience with the dual head vibrometer.

# Laser Holder on the Test Stand

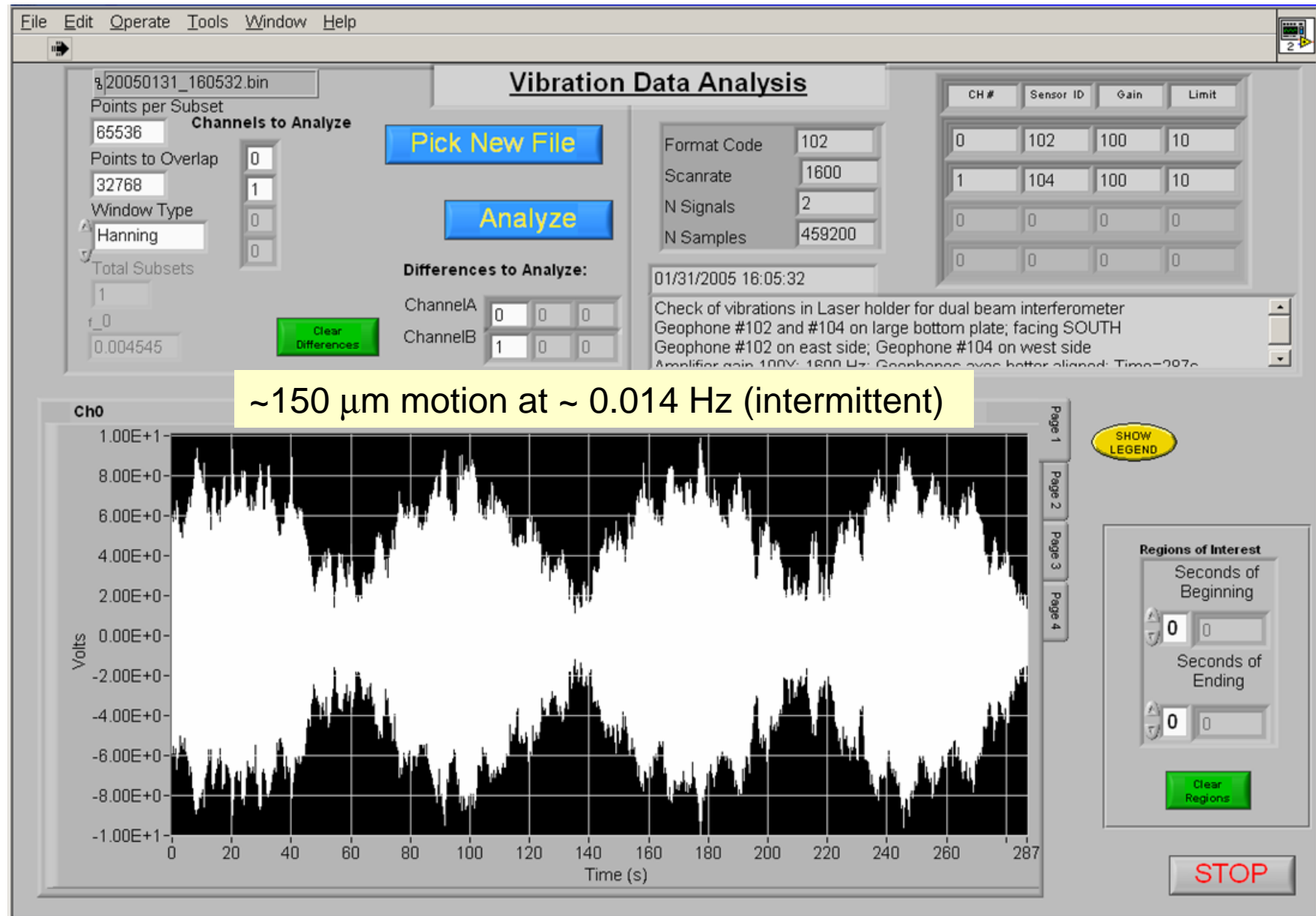




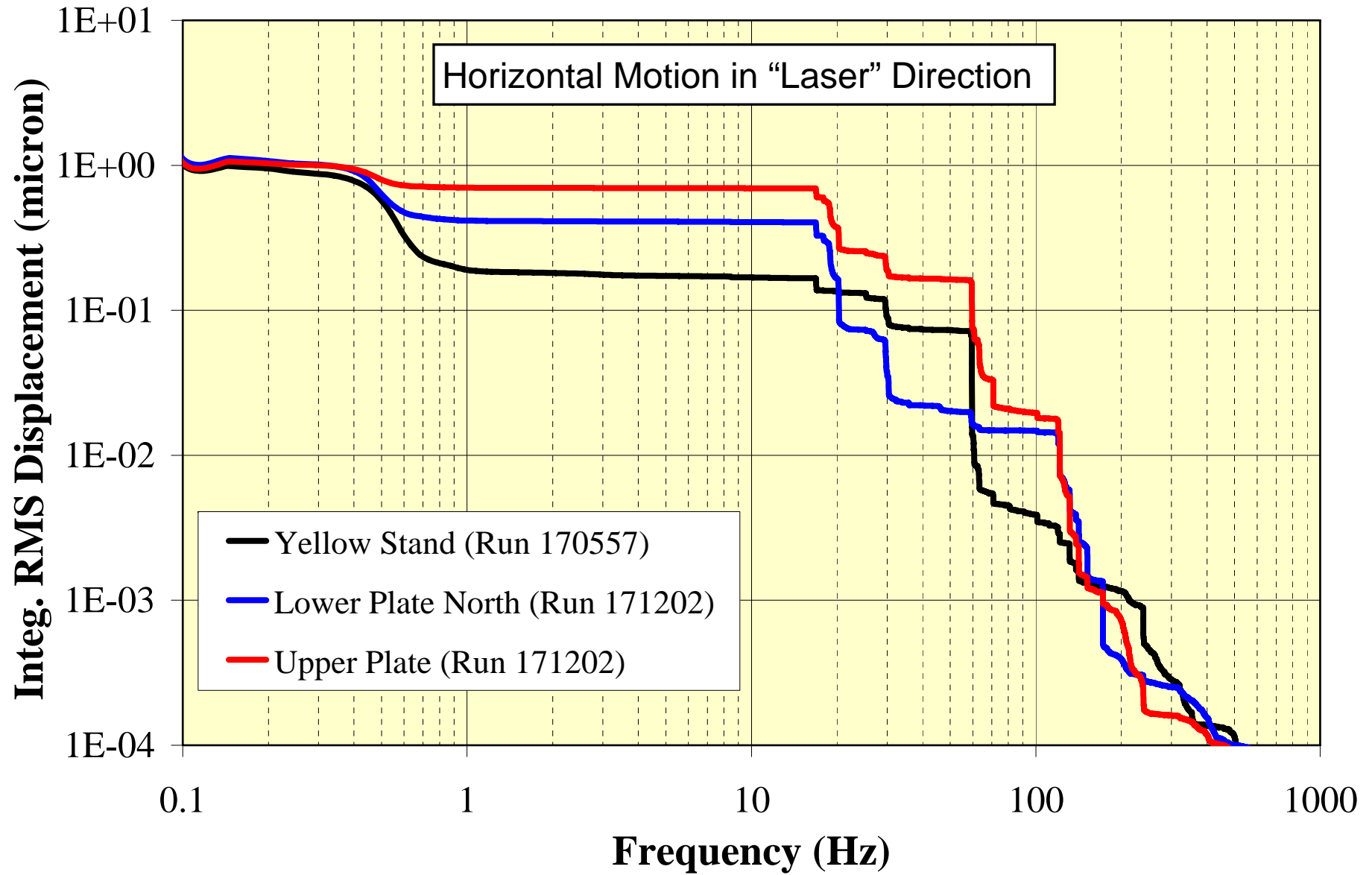
# Laser Holder Adjustment Details



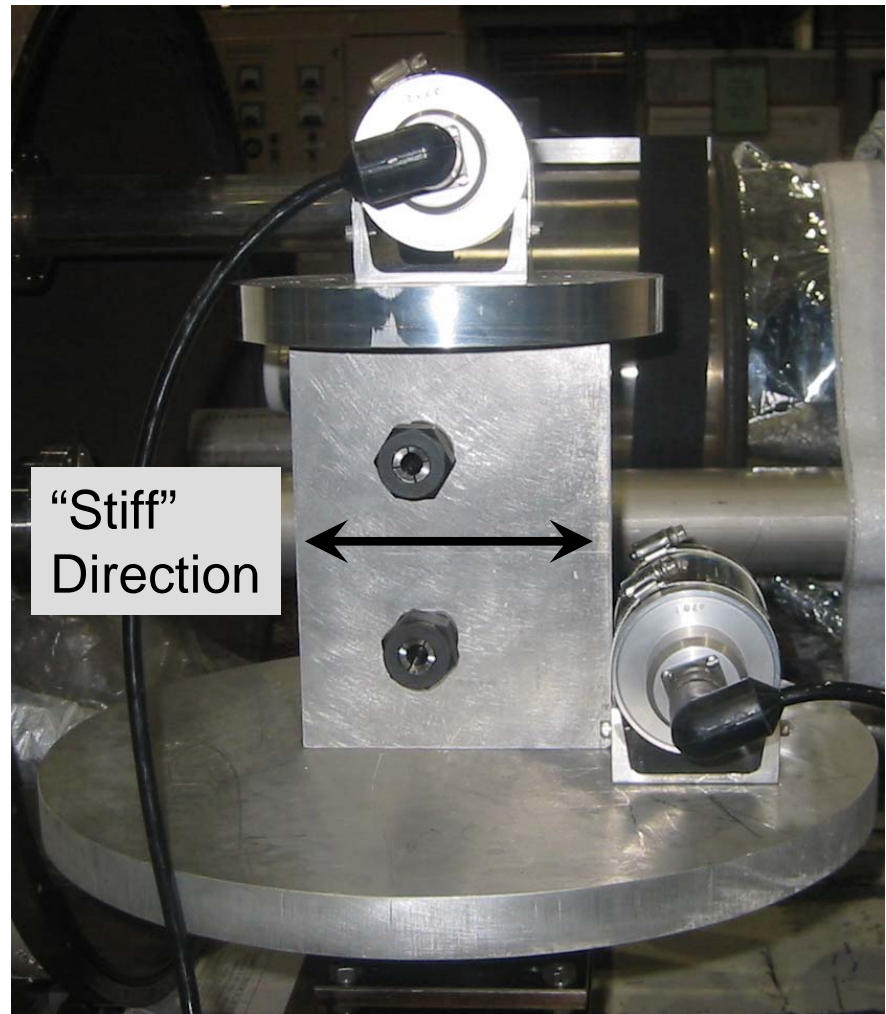
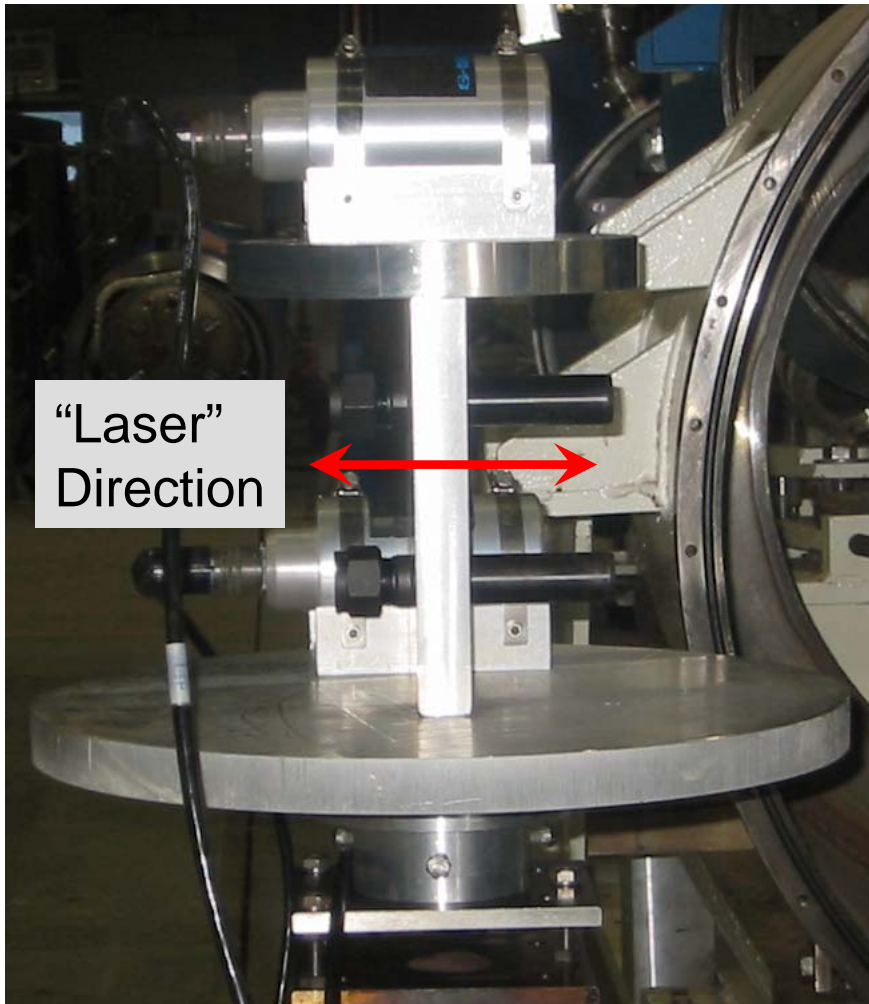
# Very Low Frequency Motion of Large Plate



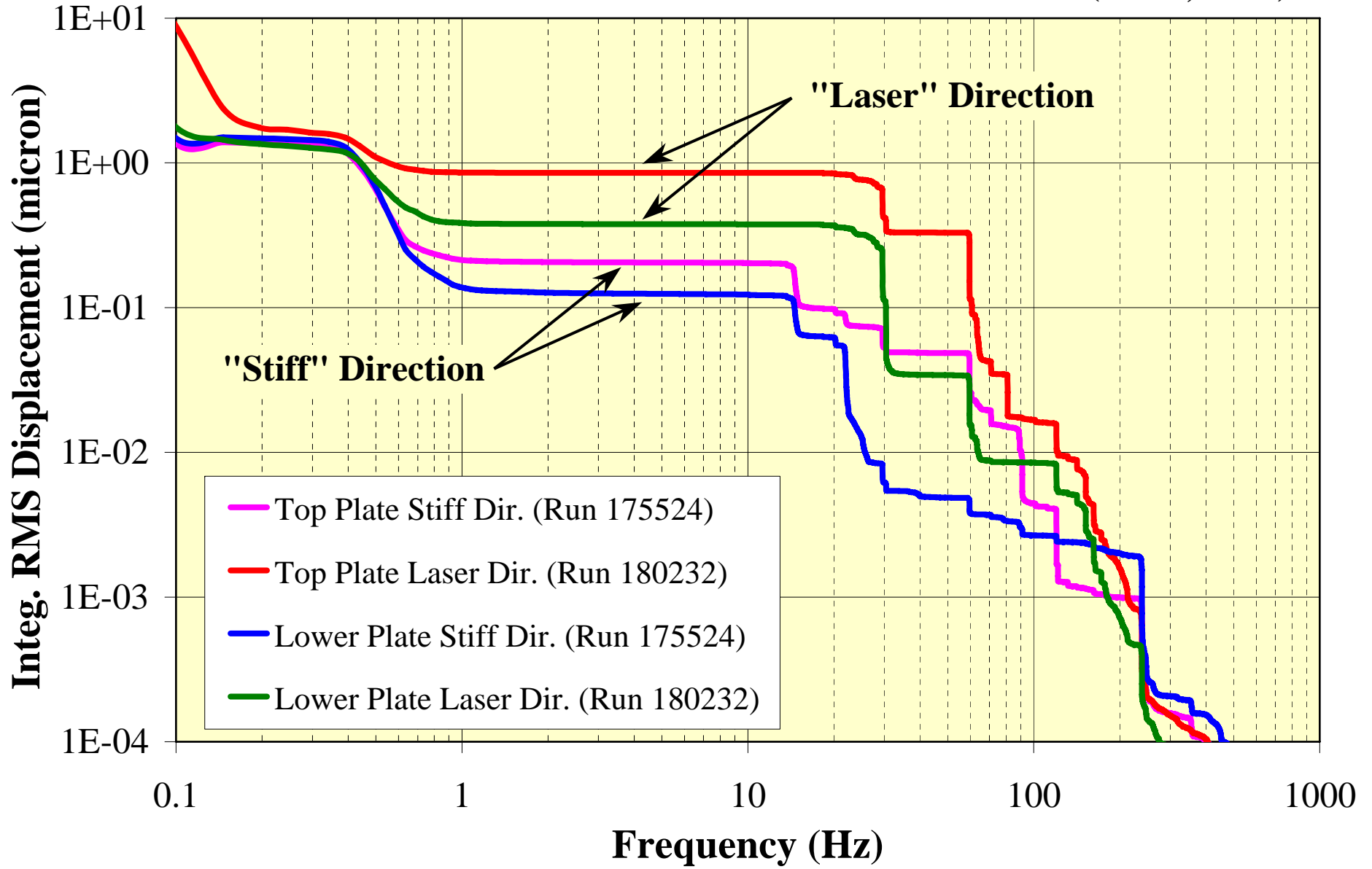
# Horiz. Motion of Laser Holder (1st Pass; Jan. 31, 2005)





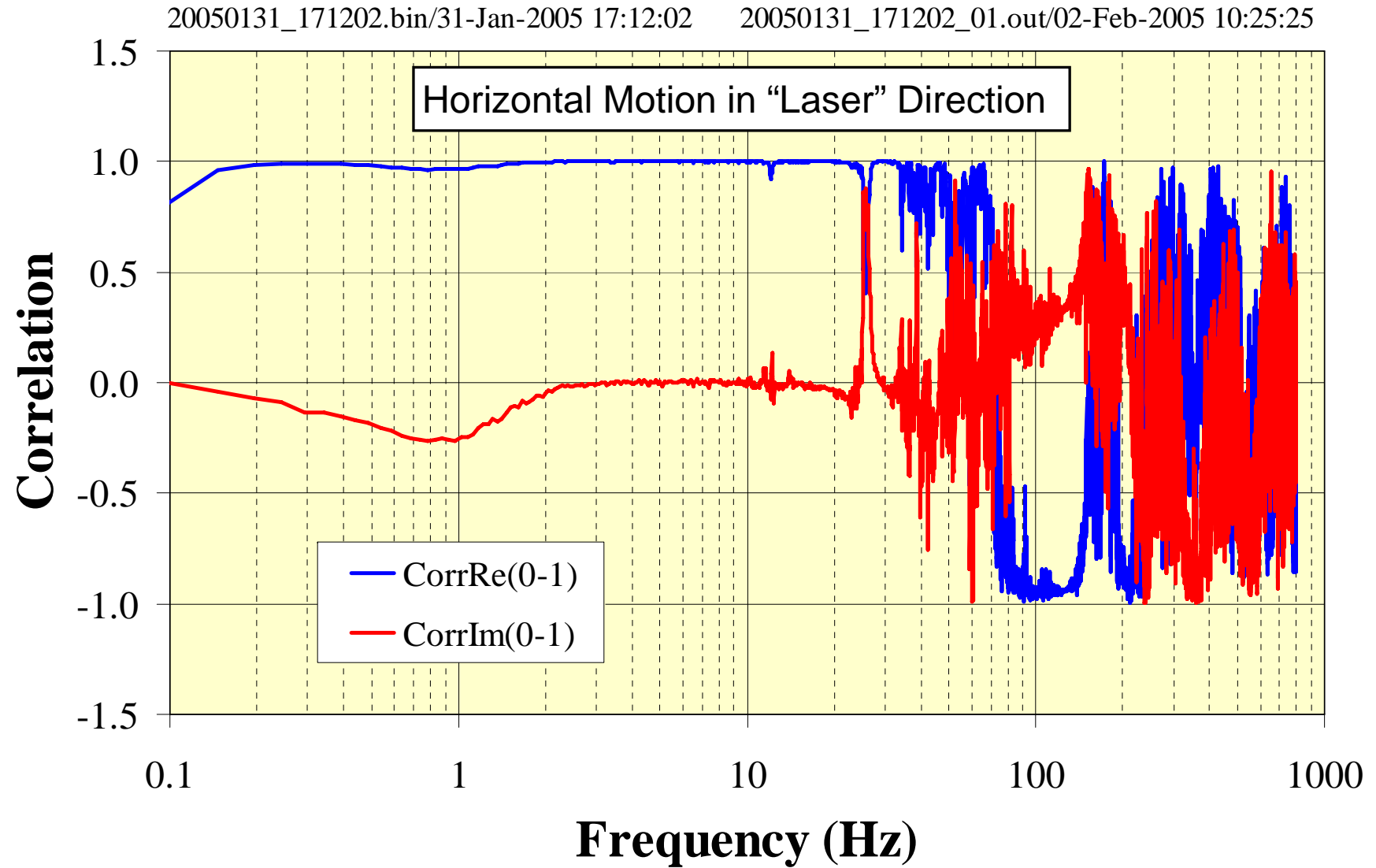


# Horiz. Motion of Laser Holder in Different Directions (Feb.4, 2005)

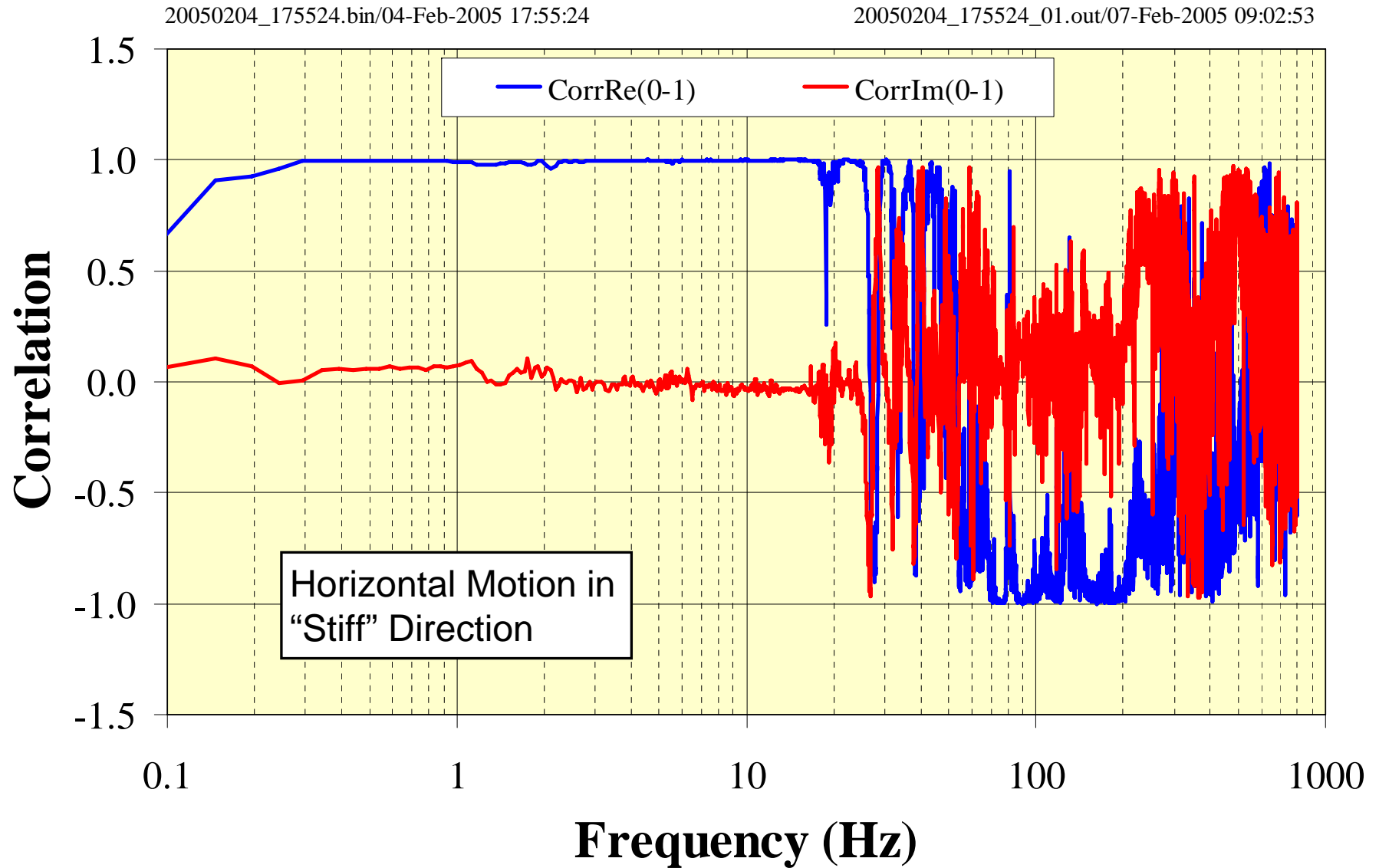




# Correlation Between Top & Bottom Plates



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# Summary of Laser Holder Measurements

- Preliminary measurements suggest that the horizontal motion in the “Laser” direction is significantly more than the test stand.
- Motion of the upper plate is more than the bottom plate.
- Motion in the “stiff” direction is much less, indicating that the “Laser” direction needs to be stiffened.
- Modifications are also needed to minimize the motion of the laser holder as a whole.

# Plans for Dual Beam Vibrometer Tests

- Shine the two beams from a dual beam laser vibrometer on two horizontal geophones placed near each other.
- Compare relative motion derived from geophones data with that measured with the laser.
- Repeat for geophone separation of about 30 cm.
- Shake one of the geophones at a given frequency and compare the geophone and laser outputs.
- Fixtures needed for the tests are being built.
- Visit PolyTec Inc. in the next 2 weeks or so.