

AGENDA FOR THE LIGO INTEGRATION MEETING

9 February 1995

Facilities

0900 - 0930

- Ground motion measurements at the sites
- Foundation motions and alignment

Lisa Sievers
Mike Gamble

Beam Tube

0930 - 1030

- QT Status & Baffle design issues
- Tube motion analysis
- Beam tube scattering measurements & baffle material options
- Synopsis of the Baffle Review Meeting

Larry Jones
Mike Gamble
Rai Weiss
Albert Lazzarini

BREAK

1030 - 1045

Vacuum Equipment

1045 - 1115

- Deferral of getter pump procurement for initial interferometer
- Procurement status & update

Mike Zucker
John Worden

Detector

1130 - 1245

- Length control modeling
- IFO configuration definition

Lisa Sievers
Jordan Camp
Dave Redding (JPL)
Yaron Hefetz

IFO CONFIGURATION DEFINITION

Background

Interferometer Topology Decision

Sep. 30, 1993

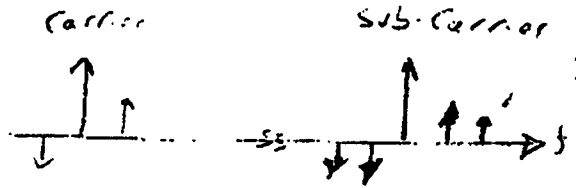
Current Status

- 1. 4,000 m arms**
- 2. Argon Laser**
- 3. Single, Short Input mode cleaner**
- 4. F.P. arms (Low Q)**
- 5. Michaelson with power recycling ($G \sim 30$)**
- 6. External modulation with Asymmetry for Gravity Wave detection**
- 7. Sub carrier for axillary (Michaelson) length sensing**
- 8. Wave front alignment sensing**

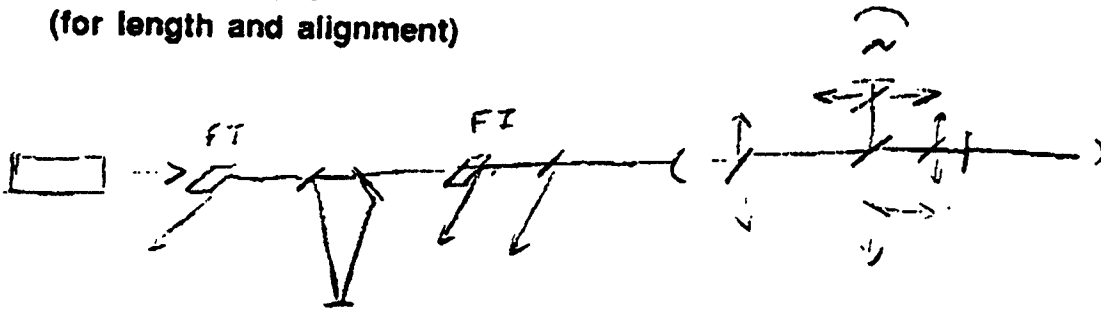
UNDEFINED OPTIONS

Topology Decision (Configuration)

1. No. of frequencies

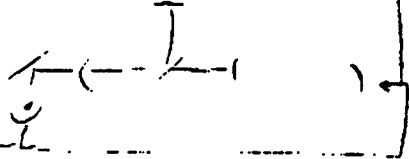


2. Pick-off locations
(for length and alignment)

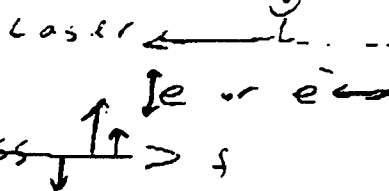


3. Servo topology

?



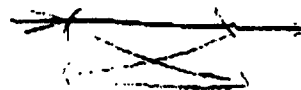
4. Polarization



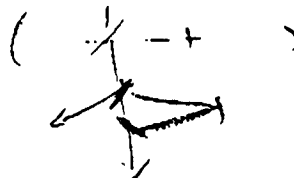
5. Input mode cleaner



or



6. Output mode cleaner



UNDEFINED OPTIONS

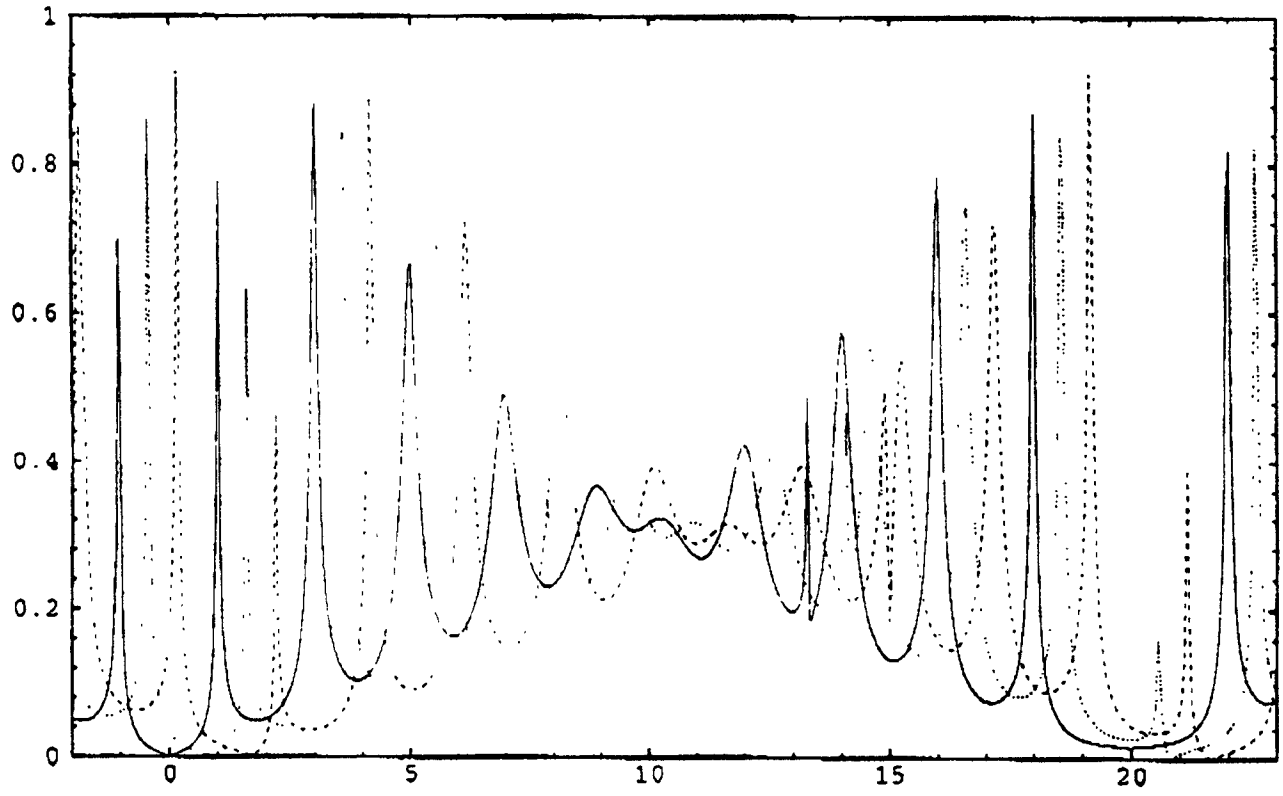
Parameter Optimization Decision (for each configuration)

1. **Radius of curvature (back mirrors)**
2. **Asymmetry**
3. **Recycling mirror reflectance**
4. **Pick-off reflectance**
5. **Frequencies**
6. **Servo gain and Frequency response**
7.
8.
9.

PROPOSED METHODOLOGY

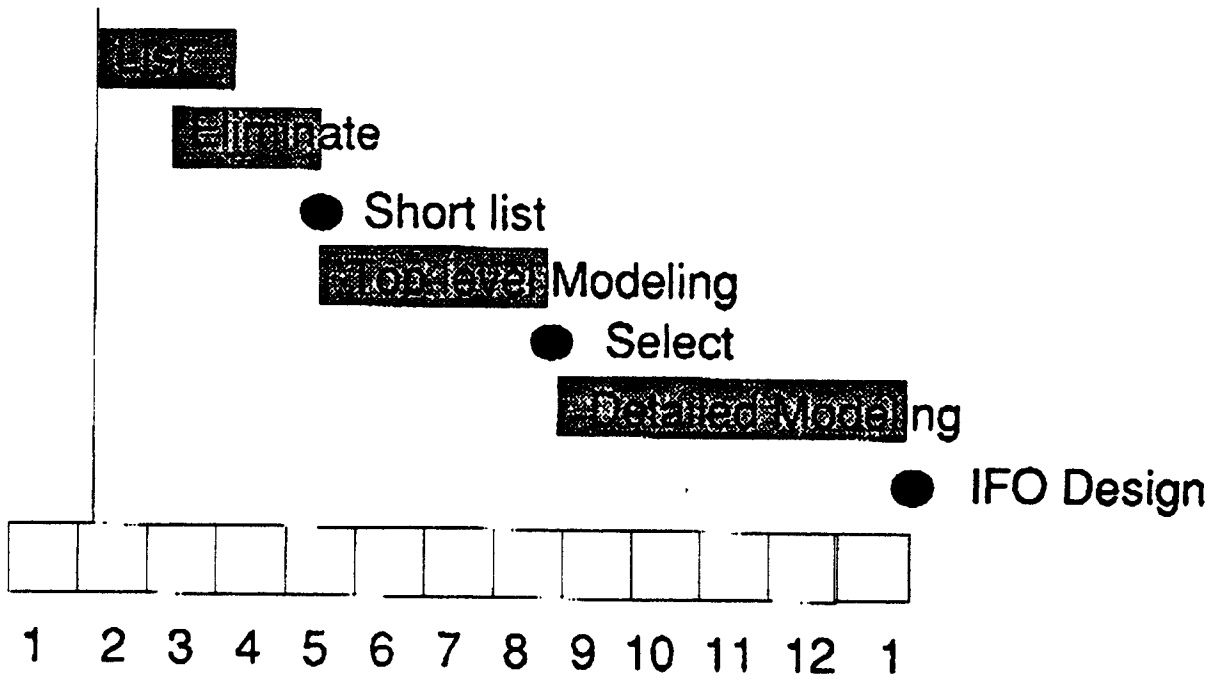
1. List all possible configuration options
2. Quickly eliminate the option that are:
 - a. Very stupid
 - b. Incompatible with:
Schedule, price, LIGO constrains
3. Generate a short list of options to be considered
4. Top level modeling for each of the options
(optimize roughly the important parameters)
5. Choose a merit function to rate the candidates:
 - a. ultimate SNR
 - b. ease of implementation
 - c. experience (in LIGO or outside)
 - d. complexity
 - e. Can we demonstrate it within LIGO
FMI at MIT or CIT, 40 m
 - f.
6. Select a candidate
7. Detailed Modeling of the selected configuration
(and best optimized parameters)
 - a. FFT
 - b. Mode Decomposition
 - c. Frequency response
 - d. Time domain (transients)
 - e. Servo stability
 - f. lock acquisition
 - g. Noise due to:
Alignment, Servo, Fabrication errors, contamination
8. Propose LIGO IFO Design

Edark



- (0,0)
- (1,0)
- - - (2,0)

Schedule



who will do it?