Title

Status of Prototype Dual Recycled Cavity Enhanced Michelson Interferometer

Tom Delker, Guido Müller, David Tanner, David Reitze

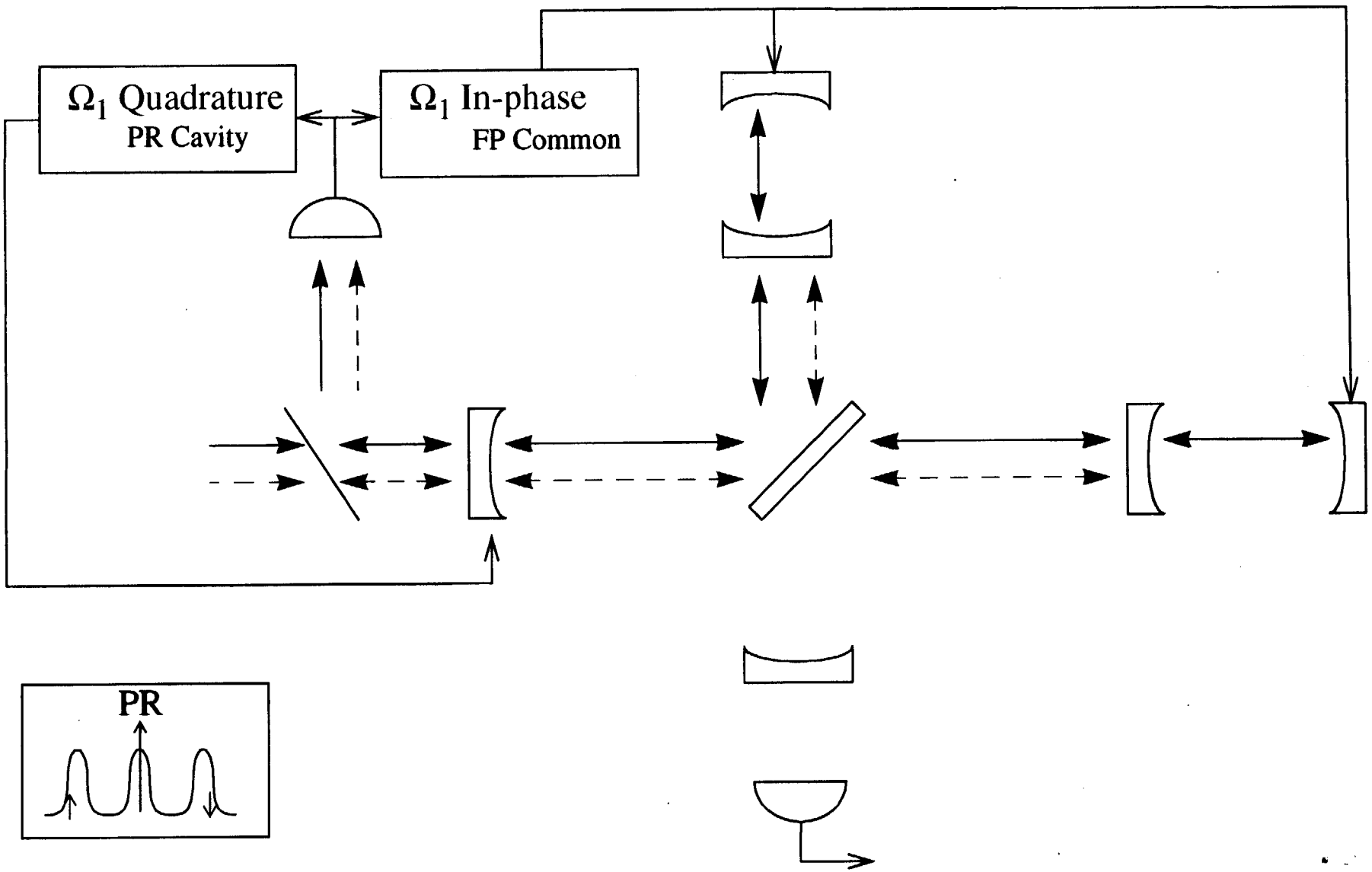
Department of Physics, University of Florida

Supported by NSF

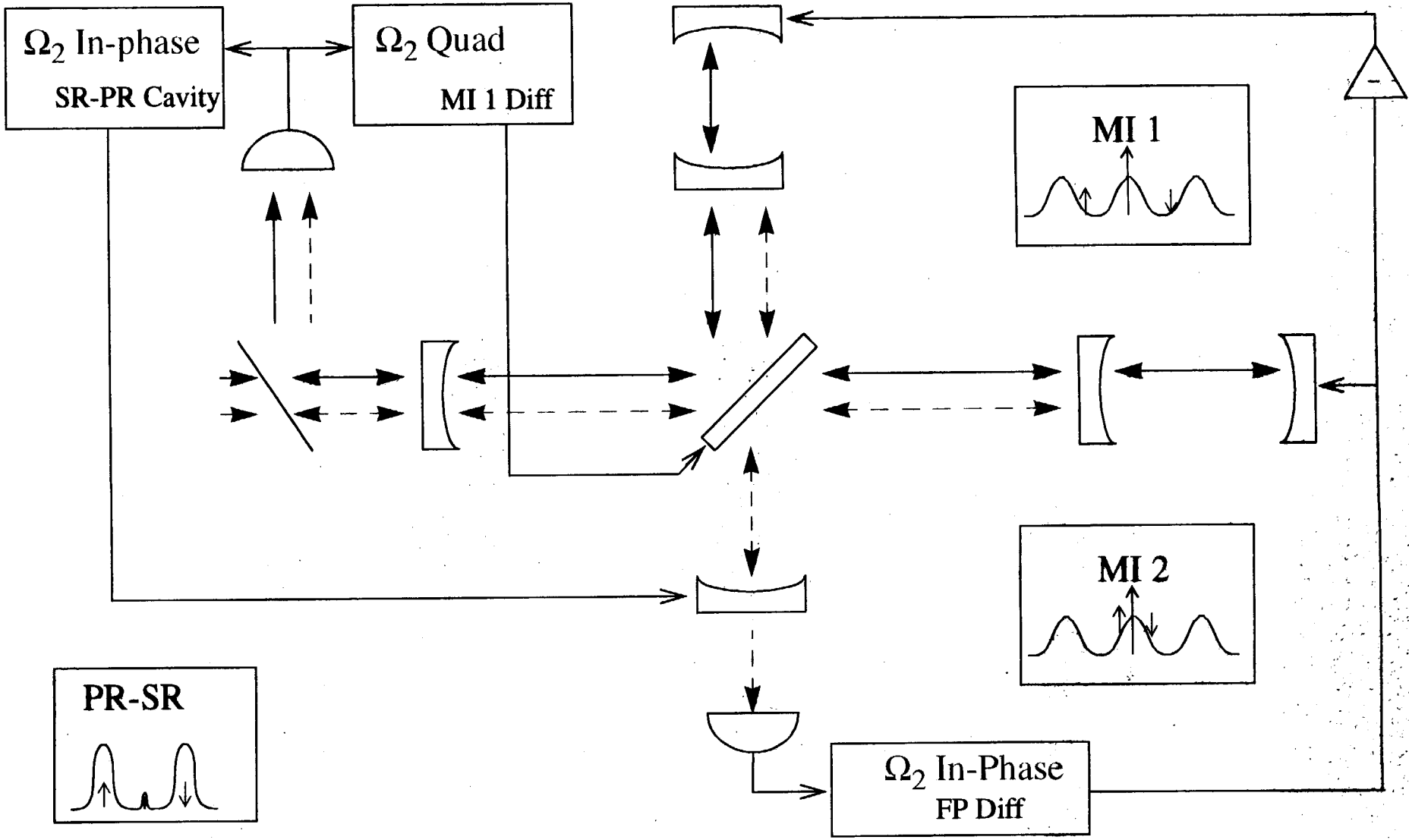
LSC
March 17th, 2000

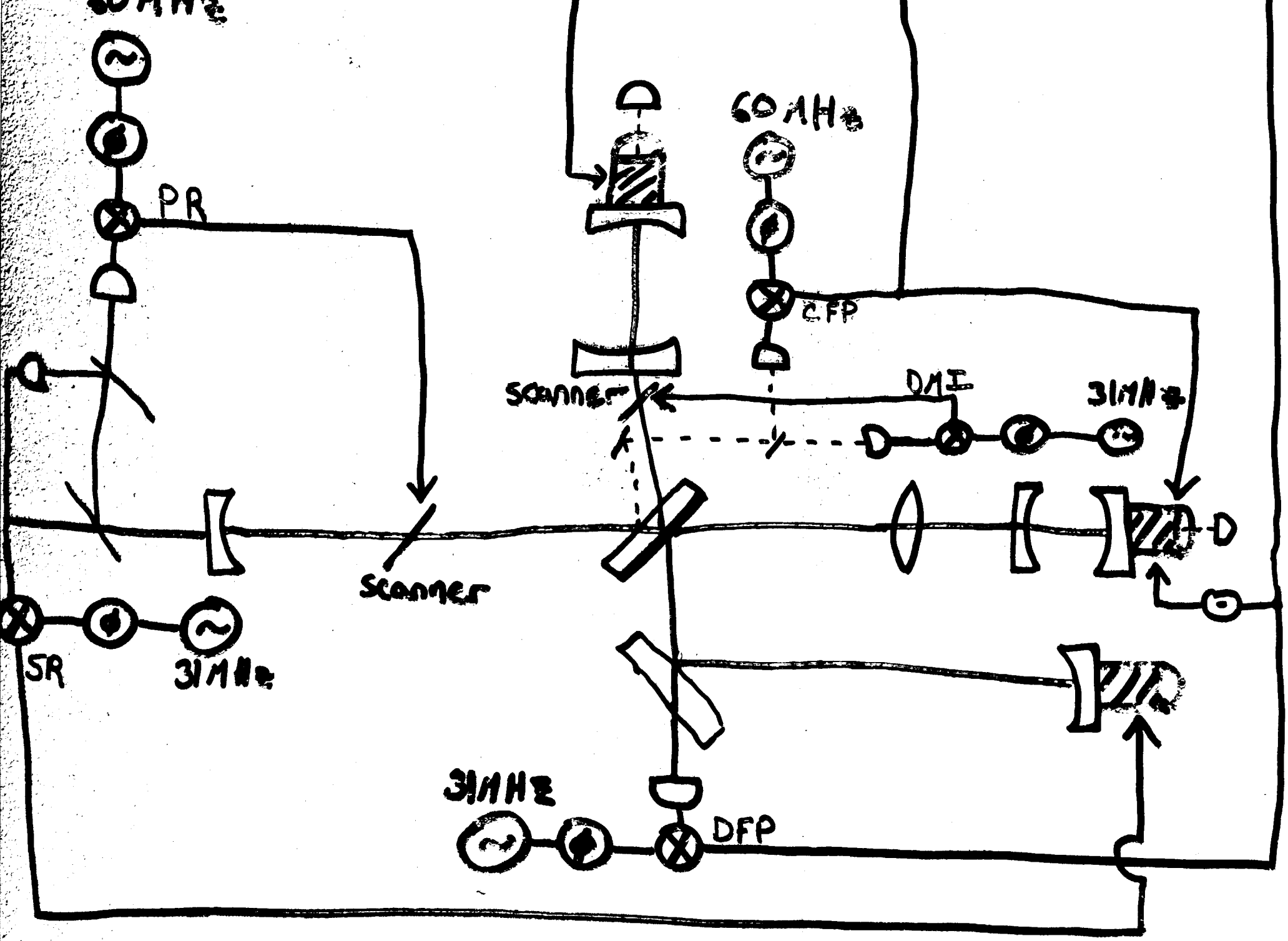
LIGO-G000054-00-D

The Locking Point I



The Locking Point II




PR
SR
Scanner
Scanner
CFP
DFP
DMI
D
D

Current Status

We have locked everything!

- Power Recycling with arm cavities
  »Fairly stable. Longest lock was 80 secs

- Signal Recycling with arm cavities, No Power Recycling
  »Very stable. Longest lock was ~5 min

- Power Recycling, Signal Recycling and Arm Cavities
  »Unstable. Longest lock was 5 secs

How to improve locks

•Increase bandwidth and gain of Power Recycling and Michelson feed back
Drivers for galvanometer scanner needs to be improved.

•Reduce losses in system (especially for 60 MHz sideband)

LIGO II

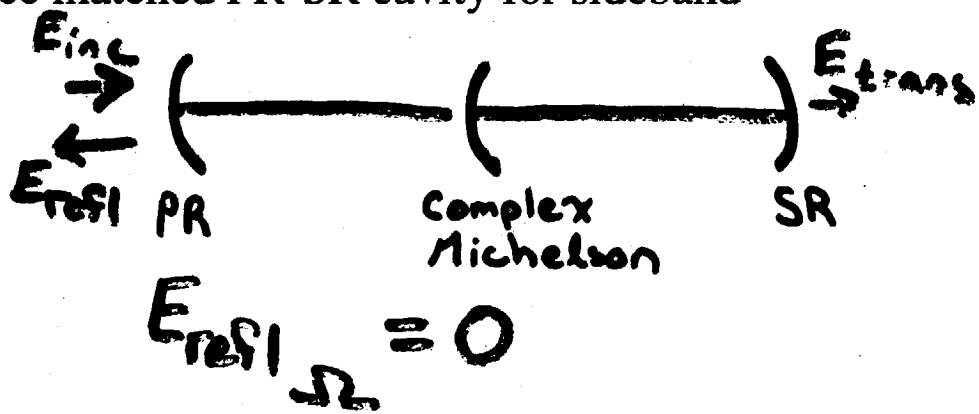
Problems for this locking scheme

- Signal Recycling Cavity has low R (64%)
  »PR-SR very difficult to see

- Differential Michelson - Signal Recycling coupling
- Differential Michelson - Differential Fabry-Perot coupling
- Detuning
  »Could create AM which will couple in noise everywhere

Solutions

- Impedance matched PR-SR cavity for sideband



Note 1, Linda Turner, 05/09/00 02:07:50 PM
LIGO-G000054-00-D