

Title

Status of Prototype Dual Recycled Cavity Enhanced Michelson Interferometer

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Current Status

We have locked everything more stable than last time

- Power Recycling with arm cavities
 - » Very stable. Longest lock was **hours**
- Signal Recycling with arm cavities, No Power Recycling
 - » Very stable. Longest lock was **~15 min**
- Power Recycling, Signal Recycling and Arm Cavities
 - » Unstable. Longest lock was **~30 secs**

Signal Recycling?

- There is **NO** increased Differential Fabry-Perot error signal in either the full LIGO II configuration or Signal Recycling with arm cavities.
 - » Too many losses for the sideband that locks Diff. FP cavities?

What To Do Next

Find Losses

- Current Power Recycled IFO with arm cavities is close to impedance matched for carrier
- Losses for sidebands

Measure Broadband Dual Recycled Characteristics

- Measure Locking Matrix
 - »Already Done for LIGO I configuration and agrees to within a few factors with modeling done by Finesse
- Measure Signal Recycling Factor
 - »Should be able to see roll-off of signal recycling (3dB point at 400kHz)

Detuned Dual Recycled (or RSE)

- Use beat between two sidebands for Diff MI signal per Guido's work