

# LSC Six-Month Progress Report

**LIGO-M010029-00-M**

**Organization** Japan NAOJ-TAMA Group

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**Attachment** D - Advanced Detector Configurations

**Participation**

## **RSE Experiment**

The Signal Extract Cavity had been successfully locked using the ordinary demodulation method. The signal comes from the beat between the first and the second sideband. However, the locking was not very stable and cannot be held long enough. We found that it was due to the mixture of the arm cavity signal into the SEC signal as we predicted. We are now changing the optical configuration to have a larger asymmetry in the distance between the beam splitter and the input mirrors in order to realize the third harmonic demodulation method. This method is supposed to eliminate the signal mixture and to make the locking much more stable.

## **RSE Theory**

We have been analyzing the third harmonic demodulation method for the detuned case and found that it will probably work with the conventional offset method.