Precise and Stable Frequency Source

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Motivation

- Stability

- Cost

- Alternatives are always useful
Outline

I. Stability

II. Scanning the laser

III. Repeatability

IV. Conclusion
Stability

- fixed laser frequency  <200kHz  $10^{-9}$

- long-term stability

6 months and running!
- HeNe lock
Pound-Drever-Hall Lock

All images from:
Pound-Drever-Hall Lock

All images from:
Scanning the Laser

- create a frequency “ruler”
- absolute frequency source:
- find Free Spectral Range (FSR)

  - 1998.142 +/- 0.01 MHz
Allen Deviation
Repeatability

- can return to any frequency within $10^{-9}$

- can return to any HeNe lock

  - with temperature

  - check markers
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Questions?