

H1 Squeezer Beam/Loop Diagram

3 July 2009 - Sheon Chua, Sheila Dwyer, Michael Stefszky, Daniel Sigg, Nergis Mavalvala

Signals

$$\begin{aligned} S_0 &\propto \phi(f_{\text{PSL}}, f_{\text{Main}}) \\ S_1 &\propto \phi(f_{\text{Main}}, f_{\text{Aux}}) \\ S_2 &\propto \phi(2\phi_{\text{Sqz}}) \\ S_3 &\propto \phi(2\phi_{\text{Sqz}} + \phi_{\text{LIGO}}) \\ S_4 &\propto \phi(L_{\text{SHG}}) \\ S_5 &\propto \phi(L_{\text{OPO}}) \end{aligned}$$

LIGO - Pre IFO

f_{PSL}

Units

- Electronic
- Frequency
- Phase
- Length

Frequencies

$$\begin{aligned} f_{\text{Green}} &= 2f_{\text{Main}} \\ f_{\text{Aux}} &= f_{\text{Main}} + f_{\text{Offset}} \\ f_{\text{Aux-2nd}} &= f_{\text{Main}} - f_{\text{Offset}} \end{aligned}$$



This 'Transfer Function' represents the length change and its impact on change in frequency (via phase change)

