Scattering Paper

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Abstract

This is the abstract

INTRODUCTION

The Laser Interferometer Gravitational-wave Observatory (LIGO) consists of two identical 4 kilometer long interferometric detectors located in Hanford, Washington (H1) and Livingston, Louisiana (L1). The detectors are Michelson interferometers with Fabry-Perot resonant cavity arms [**need ref here**]. Each detector has a 200 W Nd-YAG laser (**This may be wrong?**) that is sent through the interferometer and test-mass mirrors. These test-mass mirrors are seismically isolated using a multi-stage suspension system. The core optics are located in an ultra-high vacuum system. [**Cite virgo paper here?**]

Recently, LIGO completed the first half of its second observation run (referred to as O2) **Should I give dates here?**. Over the course of this observation period, there were many noise sources that were modeled and characterized. One such noise source, scattering, was intermittent over the course of the analysis period. Scattering is the result of diffused light scattering inside the vacuum system. Diffused light can additionally result from light scattered off of optics located on benches outside the vacuum system, which can introduce noise.

What is scatter

FEATURES

DEEP LEARNING

The inspiration for deep learning stems from the archetecture and mechanisms by which the human brain functions. To understand this, let us consider the world's simplest neural network, a single perceptron node. In a single perceptron node a set of variables we'll call, $x_1, x_2, ...x_n$, denotes a set of numerical features that describe an input sample set. Each feature is multiplied by an initially randomized weight vector of the same size and dimension as the feautre. An additional bias term is added (typically either $+1$ or -1) in order gurantee that there will always be a constant term in the output (**Need to describe the bias better!**).

TESTING SUBSETS OF AUX CHANNELS

VET RESULTS

FUTURE WORK