

Integration of LIGO-India Vacuum System components

Abstract

Laser interferometer gravitational wave observatory (LIGO) is a detector to understand origin of the gravitational waves. Gravitational waves are radiation which travel at the speed of light and are transparent to any matter and set into motion any matter they interact with. LIGO is a modified version of the Michelson interferometer. The orthogonal arms of LIGO is 4-km each and is installed for studying astrophysical events which radiate energy in the form of gravitational waves. LIGO consists of two interferometers, each with two 4 km long arms arranged in the shape of an “L”. Each arm along with different chambers (Basic Symmetric Chambers (BSC), Horizontal Axis Modules (HAM) and Cryopumps) encloses approximately 10,000 cubic meters of volume. LIGO-India is a planned advanced gravitational-wave detector to be located in India at a site near Aundha Nagnath in the Hingoli District, Maharashtra.

The Project work involve followings:

1. Study the existing model
2. Modelling of some vacuum components
3. Integration of the different components to make it complete assembled system
4. Identification of the interfaces and constraints which may arise during the installation

In this project, student will learn to gain expertise on solid works by modelling and integrate them. A Draft report will be prepared to develop the complete system.

Academic Project Requirements:

1. Required No. of student(s) for academic project: 2
2. Name of course with branch/discipline: B.E./B.Tech. Mechanical Engineering
3. Academic Project duration: (a) Total academic project duration: 16 Weeks (b) Student's presence at IPR for academic project work: 4 Full working Days per week
4. Email to: ncgupta@ipr.res.in[Guide's e-mail address], rakeshk@ipr.res.in[Co-Guide's e-mail address], and project_me@ipr.res.in [Academic Project Coordinator's e-mail address]
5. Phone Number: 079 -23962435 [Co-Guide's phone number]

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Phone Number: 079 -4025 [Guide's phone number]