

Residual Amplitude Modulation Servo Electronics Design and Implementation

Type of contract

Internship contract for a period of 5 months within the EGO Electronics laboratory, funded by the EGO Consortium.

The activity may start on February, 2018.

Description

The Virgo interferometer is the most sensitive gravitational-wave detector in Europe. It was realized in partnership between the French and Italian institutes CNRS and INFN. It involves a wide collaboration of almost 250 scientists and engineers. After a deep modification of the interferometer, to give birth to a new generation detector called Advanced Virgo (AdV), and after the successful science run together with the LIGO detectors, the instrument is now being commissioned to become fully operative for the second stage of sensitivity improvement.

The EGO Consortium (European Gravitational Observatory), located in Cascina, near Pisa – Italy, hosts the Virgo detector and has been also deeply involved in the design and construction of Advanced Virgo. In particular, the electronics group of EGO Interferometer Technology Department is in charge of the electronics of input optics system for AdV.

An essential part of the detector is the electronics for the front-end associated with light sensors used in the experiment and that of the control systems. Several feedback loops necessary to meet the project sensitivity requirements need to guarantee high performance both in terms of noise suppression and dynamics. This holds true for the Residual Amplitude Modulation Stabilization (RAMS). Its goal is to suppress the unwanted amplitude modulation introduced as a collateral effect of the phase modulation of the Advanced Virgo Laser beam to values of the order of few parts per billion of the sideband amplitude. This represents a very challenging goal and a system with this level of performance cannot simply be bought on the market. Therefore, it must be custom developed.

Within the Electronics Group, the student will be in charge to design and then build the printed circuit board for RAMS Servo electronics using electronic design CAD software packages. Once the unit is fully assembled, its complete characterization will be required with adequate laboratory instrumentation to validate its performance and certify it meets the specifications.

She/he will at first get acquainted with the software tools used at EGO for electronic board design and afterwards become familiar with the instrumentation available in the electronics laboratory up to the point where he can use it autonomously, with confidence, and reliably.

Requirements

The applicant should have completed (or complete soon) his/her third year of Electronics study at University level (Bachelor/Laurea triennale).

English required. Good attitude to electronic experimental work is an asset.

European citizenship, no criminal convictions.

Place of work

EGO - European Gravitational Observatory – Via Edoardo Amaldi n.5 cap 56021 Loc. S.Stefano a Macerata - Cascina (Pisa) Italia.

This internship will be carried out in the Interferometer Technology Department in the Electronics Area.

Considering the lack of public means of transport to reach the site, it is preferable having a car.

How to apply?

Interested candidates are invited to fill in the [Internship Application Form.pdf](#) and send it, together with the CV, to jobs@ego-gw.it

Further information

For the whole duration of the internship, EGO will pay a gross monthly wage of 500,00 euro and offer the lunch service at its canteen during working days to the student.

Interested candidates can have a look at all of the conditions of the agreement here:

1. For the Italian Universities: [Internship Agreement with project.pdf](#)
2. For the Foreign Universities: [Internship Agreement with project.pdf](#)

Closing date for applications

Until position is filled

Contact

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