



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Esperimentazioni di Plasmi

1920-3-E3001Q062

Aims

Aim is to give students the skills to plan and to implement a suitable diagnostics to perform basic measurements on laboratory plasmas in linear device to be used to generate plasma.

Contents

development of an electrostatic probe (Langmuir), measurements of fundamental plasma parameters in the linear device.

Detailed program

the course, held at the laboratory of the linear machine GYM at the Institute of Science and Technology of Plasma - CNR, Milan, is preceded by a first theoretical part in which are provided the main concepts on laboratory plasmas to be used then during the experimental phase. Hints will be given on wave-plasma interaction at the electron cyclotron frequency, on the use of power microwaves and on the electrostatics probes used to diagnose the plasmas.

In the second part of the course, a practical and experimental activity, the students will design and implement the diagnostic system (electrostatic probes) to measure the spatial trends of the main parameters of GYM plasma (electronic density and temperature, plasma potential, Mach number and possibly fluctuations) in different experimental conditions (neutral gas pressure, magnetic field and RF power) chosen according to the interest of the students and of the experimental program of GYM. Learning the capability of the entire planning, implementation, data acquisition and software processing of the measures is the aim of the course. In the final report the students will be guided in the writing, according to a rigorous scientific language, of what was done

during the experimental phase, reporting results and elaborating, if necessary, the interpretative models in GYM's broader scientific objective on the study of plasma fluctuations.

For the year 2019-2020, part of the course will be done in the Lab of university, on a linear machine for cold plasmas on which characterizations of plasma and x-ray emission (generated by an electronic gun) will be performed. The interaction between the generation of x-ray and plasma will be studied.

Prerequisites

Physics II

Teaching form

lessons and experimental activities

Textbook and teaching resource

F.F.Chen, "Introduction to plasma physics", Plenum (1984), 3rd Edition - Springer International Publishing (2016).

G.Pucella, S.Segre - *Fisica del Plasma* – Ed. Zanichelli (2010)

Semester

III° year, 2° semester

Assessment method

oral with open questions, after presentation and discussion of a written report on the experimental activities.

Office hours

On scheduled meeting. previously agreed by email.

On the website: www.ifp.cnr.it it is possible to find information about the lecturer,

the phone number of the office, the working site and

the e-mail to agree appointment with the students.
