



Contribution ID: 67

Type: **talk**

## Beam dynamics in resonant plasma wakefield acceleration @SPARC\_LAB

*Tuesday, September 15, 2015 4:30 PM (20 minutes)*

The purpose of this contribute is the study of the matching conditions of the electron beams inside plasma in the context of the 3 bunch comb scheme experiment in preparation @SPARC\_LAB.

We begin by discussing the motivations that led to the choice of the quasi non-linear plasma regime for this experiment.

The study will be carried out through the analysis of some simulations performed with Architect a code developed specifically for comb studies.

An analysis will be performed about the influence of the drivers transverse spot size and length on the shape of the bubble in order to make the fields as stable as possible. In this regard the optimal injection distances and the possibility of a charge ramp will be investigated as well.

A similar analysis will be performed for the witness spot size in order to prevent oscillations that could lead to emittance growth. The other features of the witness, longitudinal length, injection distance and beam loading, will be studied in order to prevent energy spread growth.

All the parameters used in this study were taken from experiments and simulations performed within SPARC\_LAB facility.

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**Session Classification:** WG1 - Electron beams from plasmas

**Track Classification:** WG1 - Electron beams from plasmas