

# Specification of the interfaces between systems for the LhARA CDR

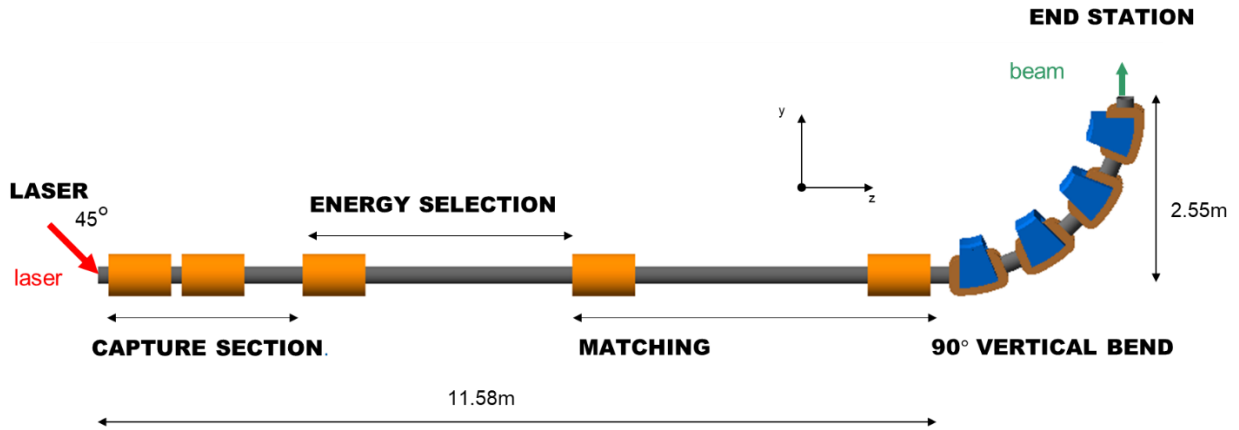


Figure 1: Schematic diagram of LhARA Stage 1.

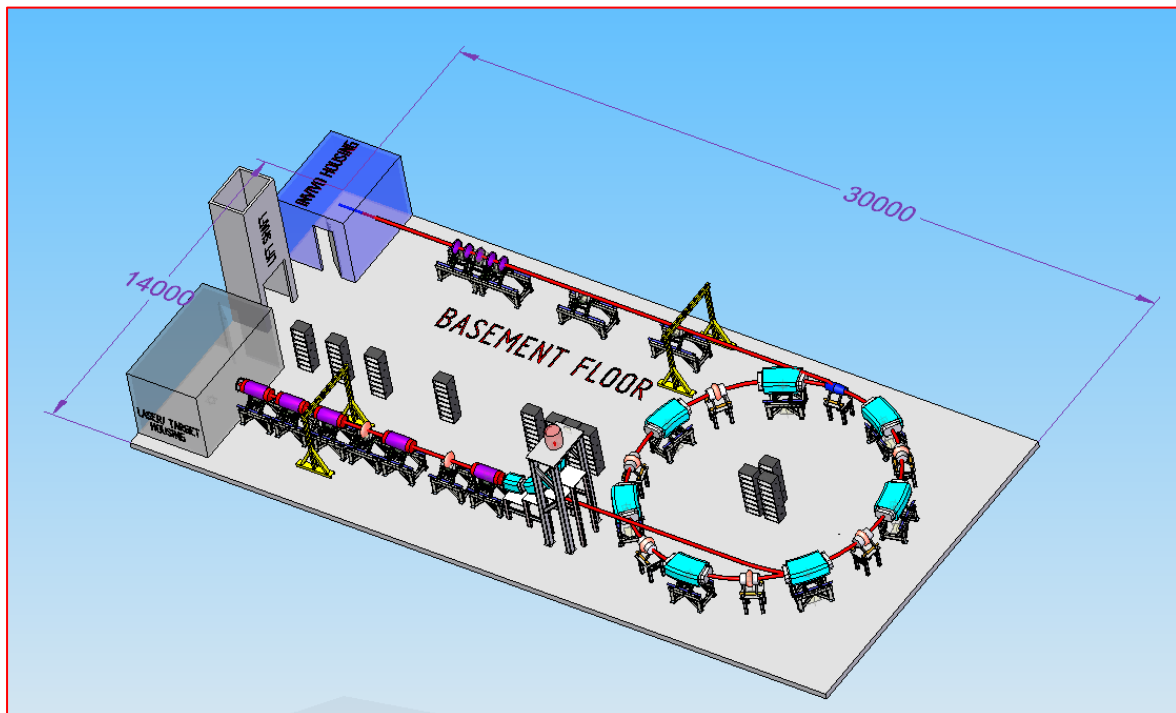


Figure 2: LhARA Stage 2 beam line

The LhARA beam line is divided into the following systems.

## Laser

The laser system includes the laser and the target vessel. The exit flange of the laser target vessel defines the interface between the laser system and the capture system.

## Capture

The capture system consists of the first set of focusing elements immediately after the laser target, which is nominally the first two Gabor lenses. The details of the Gabor lens (including fields maps) will be defined here and the same design will be used within the beam transport design.

## Beam transport for Stage 1

The beam transport for Stage 1 goes from the exit face of the capture up to and including the entrance windows of the end station and includes energy selection, matching and the 90<sup>0</sup> bend. The provision for the transfer line to the FFA in Stage 2 needs to be included.

## Beam transport for Stage 2

This includes, any transfer lines from Stage 1, injection into the FFA, the FFA, extraction, transfer line to the end station up to and including the vacuum window. Options for phase rotation and transfer line to a second end station (for in vitro studies).

## End station for Stage 1

All equipment after the vacuum window, diagnostics, ancillary equipment.

## End station(s) for Stage 2

All equipment after the vacuum window, diagnostics, ancillary equipment. Option for a second end station for in vitro studies.

## Diagnostics

Includes all devices throughout the facility used to characterize the beam, including intensity, energy profiling detectors, dose monitoring and calibration.