

# **Study of Light Source in the Soft X-ray Region for the Development of a Tabletop Microscope**

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The aim of the experiment is to study potential Laser Produced Plasmas (LPPs) light sources for the development of a tabletop soft x-ray microscope. The region of interest is in the water window (2.2-4.4 nm), where water is transparent and organic matter made of Carbon and Nitrogen attenuate the radiation thus producing high contrast images. The spectroscopy and pinhole imaging of the LPPs was conducted in order to find a source that will produce light in the ROI but also to produce the smallest plasma. The size of the plasma is important to obtain synchrotron like brilliance and make the tabletop system as effective as facilities at the synchrotrons.

The plasma was created by focusing a 15 ns Nd:YAG laser with a 20 and 50 mm aspheric lenses. The radiation from the LPPs was observed at an angle of  $45^{\circ}$  using a grazing incidence spectrometer, and also at right angle to the target using pinhole setup. The target materials studied in this experiment were Molybdenum (Mo) and Titanium (Ti). The experiment showed that Mo could be a promising source for a soft x-ray microscope, as it emits in the water window region and the plasma are very small ( $\sim 10 \mu\text{m}$ ) and stable which is desirable for such a system.