DREAM - A New Soft X-ray (Dynamic REAction Microscopy) COLTRIMS Endstation at LCLS-II

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SLAC is building new soft X-ray beamlines to take advantage of the LCLS-II upgrade to 1 MHz. One of the new beamlines is called TMO (Time resolved Molecular Optical science) also known as NEH 1.1. It will be a soft X-ray beamline featuring two sets of KB mirrors to create a sub-micron X-ray focus at its second, most downstream interaction region where the DREAM COLTRIMS (COLd Target Recoil Ion Momentum Spectroscopy) endstation will be situated.

COLTRIMS Spectrometer and Laser Path
- Notches are included for laser path and diagnostic paddle
- Gas Jet
- Chamber vertical motion stand
- Helmholtz Coil

In order to achieve a spot overlap spec of 0.5 um; the KB mirrors, laser optics, & beam position diagnostics all sit on a common granite support structure to minimize mechanical vibrations and thermal drifts. The entire endstation will have a motorized vertical range of 20mm to offset the spectrometer to account for varying kinetic energies of a wide range of gas samples.

Expected pressure profile
In order to achieve the desired base pressure of 3e-11 torr, a 4-stage jet, 2-stage catcher, will be used. In addition, all parts will be extensively cleaned and baked, and a large number of turbo pumps and getter pumps will be used. The calculated pressure profile is shown in the image at the right progressing from the gas nozzle chamber to the end of the catcher.

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