Cryogenic jet targets for high repetition rate experiments at FEL and high power laser facilities

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The High-Energy Density (HED) science instrument of the European XFEL is dedicated to studies of matter at extreme conditions with ultra-bright and ultrashort X-ray pulses [1]. To push the frontier in HED science, e.g. relativistic laser plasmas or shock compressed materials, the development of new target delivery systems has significant importance. In particular liquid jets are promising targets because they provide debris free samples at high repetition rates. Producing liquid jets under cryogenic conditions allows in addition to deliver ambient gas phase elements at liquid/solid densities, such as hydrogen, helium or methane - all of which of high interest in the HED field. This talk will give an overview on recent activities on the development of cryogenic liquid hydrogen jets [2] and their application in free-electron laser [3] and high power laser experiments [4].

References

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