Contribution ID: **21** Type: **not specified**

A light-gas driver for studies on material properties with PRIOR

Wednesday, 21 June 2017 16:00 (1h 45m)

At FAIR a novel diagnostic system the proton microscope (PRIOR) will use high energy protons for radiography. Thus the ion accelerator will be used for accelerating the protons for diagnostics an external driver for dynamic experiments is needed. At the Technische Universit¨at Darmstadt the design and realisation of a two stage light-gas accelerator as a driver for flyer acceleration is ongoing. The present state of the construction of this device will be presented.
The first stage of the device consists of four pistons driven by methane combustion. These pistons compress and heat up Helium in the second stage. The Helium then is supposed to accelerate a sabot carrying a flyer. According to present estimations the two stage device could accelerate 3 g loads up to about 3 km/s. The flyers will shock load different. types of targets. The resulting material states and shock waves inside the targrt should be investigated by a combination of proton radiography and other means.

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Session Classification: Poster Session with Coffee break