Real-time imaging: Model air-craft combustion engine

The high flux at the first position is a precondition for real-time experiments, where fast processes are examined. As a test sample an aluminum model air-craft combustion engine was investigated.

The collection of the data was based on the so-called stroboscopic method for repetition processes. Images can be accumulated due to the periodic character of the process. Thus an average "snap-shot" image with better statistics is obtained. By recording a series of such accumulated snapshots, the whole combustion cycle can be visualized. The experiment was performed at a rotational speed of the engine of 6000 rpm. The exposure time was set to 1 ms. For every defined piston position 500 images were recorded and accumulated. The time delay between two piston positions was set to 1 ms. Two snapshot images at different times are shown in Fig. 1. It is the aim of this work to investigate the fuel injection in an operating combustion engine.
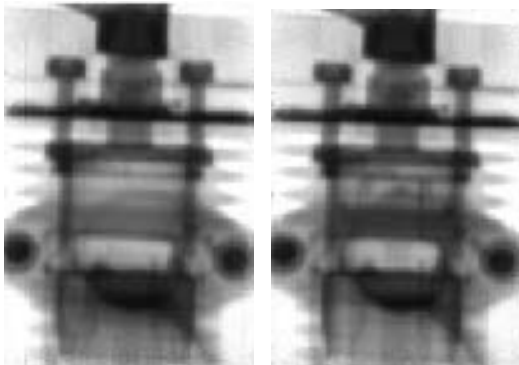

Fig. 1: High-speed neutron tomography