



Contribution ID: 52

Type: Talk

Ultra-intense X-rays in PW laser plasma - generation, transport and application to study radiation dominated and warm dense matter

Friday, October 5, 2018 11:45 AM (30 minutes)

In experiments with pico- and femtosecond optical laser pulses of relativistic intensities exceeding 10^{21} W/cm² the laser energy is efficiently converted to X-ray radiation, which is emitted by hot electron component in collisionless processes. In turn, the intense X-ray radiation effectively ionizes the matter inside out, providing a large population of exotic states called hollow ions, and opens the way to study the matter in Radiation Dominated Regime. As well, together with fast electron flow, the radiation heats up the vicinity of the focal spot and deep-lying layers of the target to Warm Dense Matter states.

In this context, the following recent experimental studies on intense X-ray generation and consecutive phenomena in relativistic laser plasma of solid targets are overviewed:

- Non-linear growth of X-ray yield while optical field intensity ranges from 10^{19} to 10^{22} W/cm², and spectroscopy studies on X-ray emission from deeply-charged high-Z ions;
- Observation of KK-hollow and high-n-hollow atoms, and the matter in Radiation Dominated Kinetics Regime in picoseconds PW laser plasma;
- Transport of laser-generated X-rays through inner-lying target layers, and WDM temperature measurements by means of X-ray absorption spectroscopy.

Primary author: Dr PIKUZ, Sergey (JIHT RAS)

Presenter: Dr PIKUZ, Sergey (JIHT RAS)

Session Classification: Fast events - Inertial Confinement