Status of the Pellet Target

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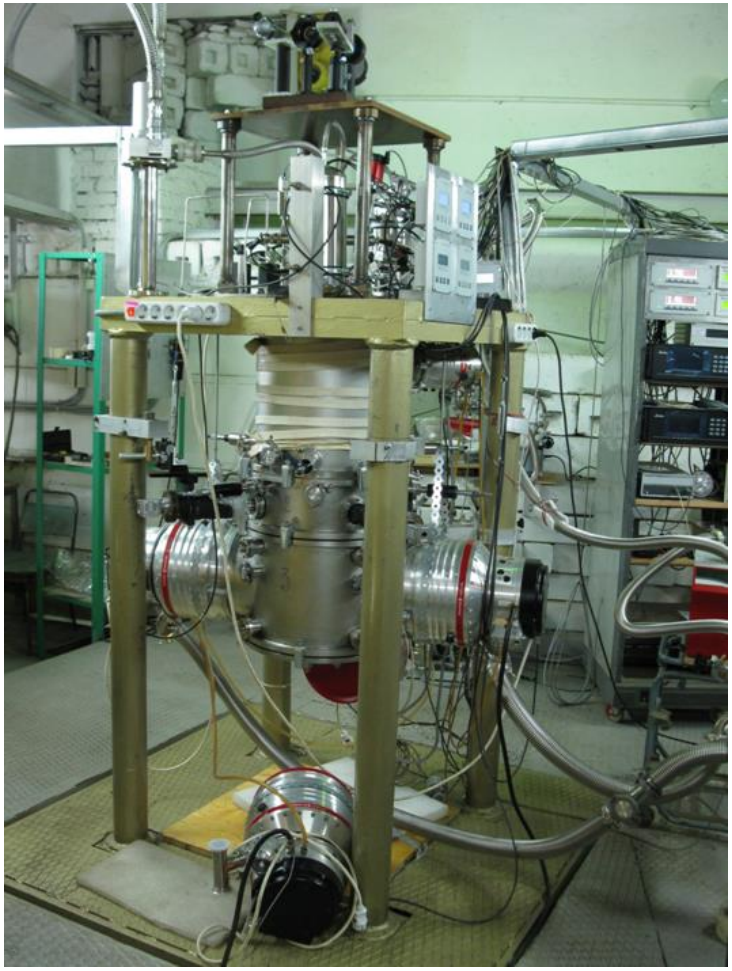
Tests of target prototype in ITEP



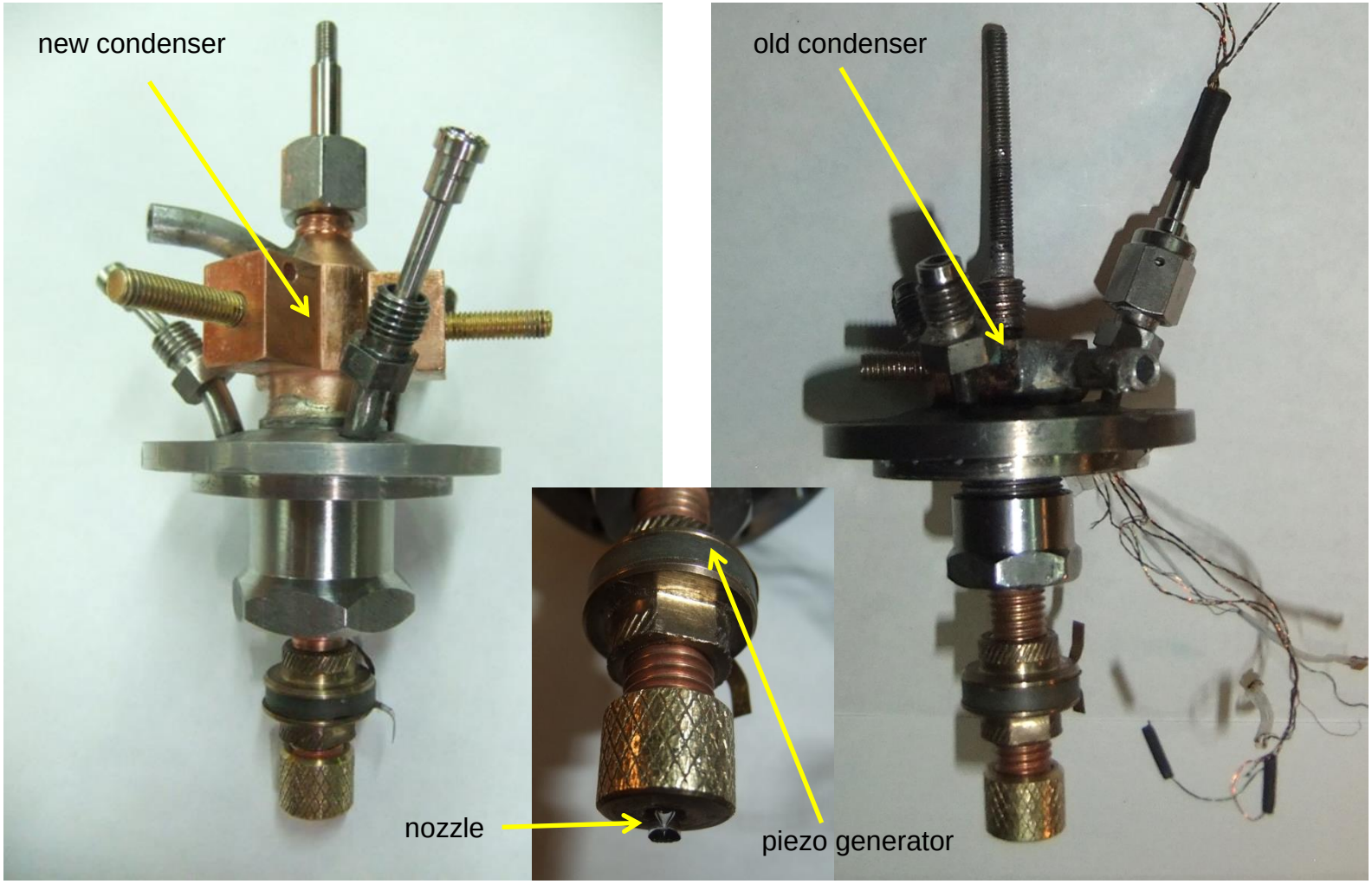
Main goals of tests:

- optimization of temperature distribution for stable jet production
- investigation of nozzle clogging
- dependence of jet from operation regimes

Status: jet and droplet production in the triple point chamber

New design of the condenser

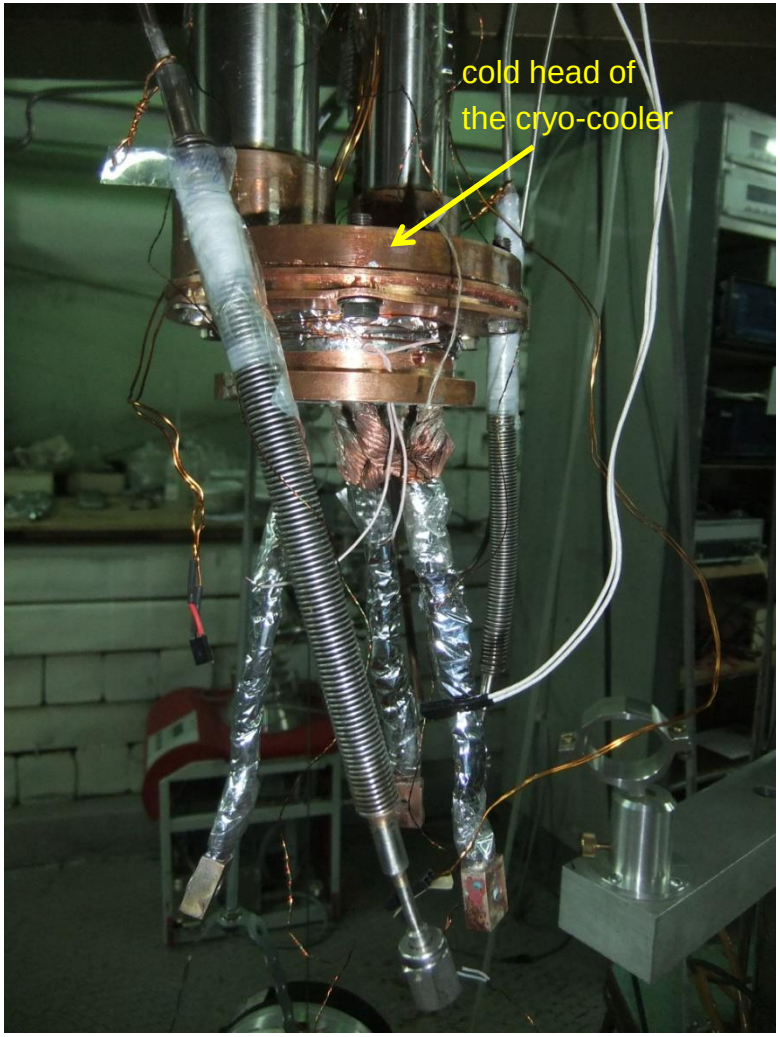
Goal: optimization of temperature distribution for stable jet production



Status: first cold tests with new condenser in November

Optimization of cold transfer lines

better cold transfer from the cold head to the condenser unit

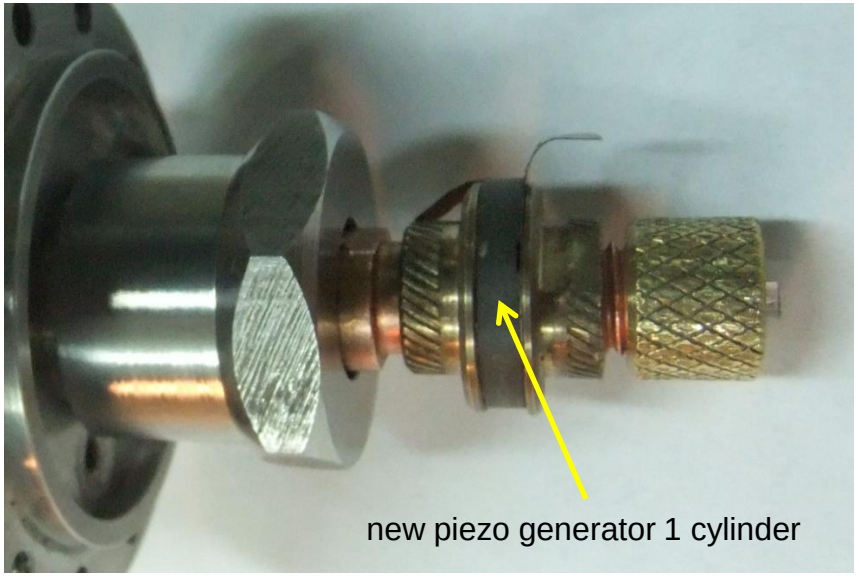


new transfer lines mounted

old transfer lines

New piezo generator and new fixing of nozzle

Goal: more effective operation of the generator



Investigation of nozzle clogging

New mounting of glass nozzle:

- old metod – epoxy glue
- new method – with indium sealing
- new filter before the condenser

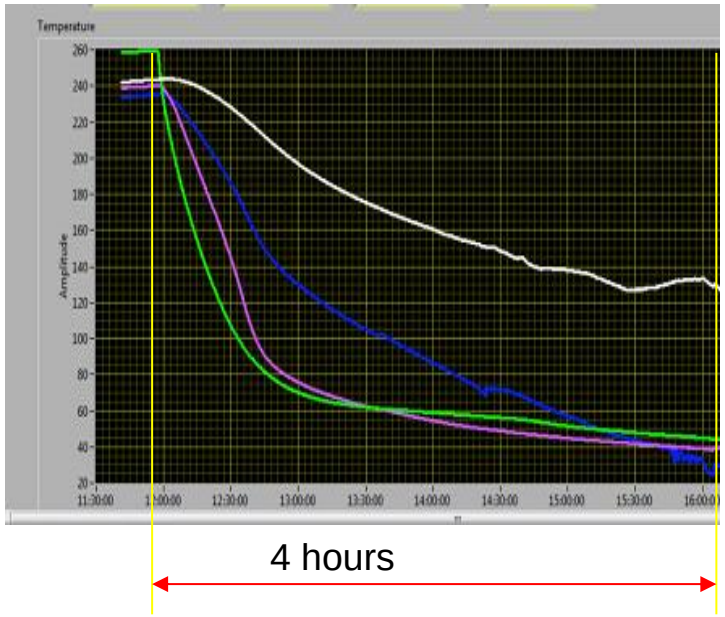
First results: 3 days of operation without clogging

Status: investigations are going on.

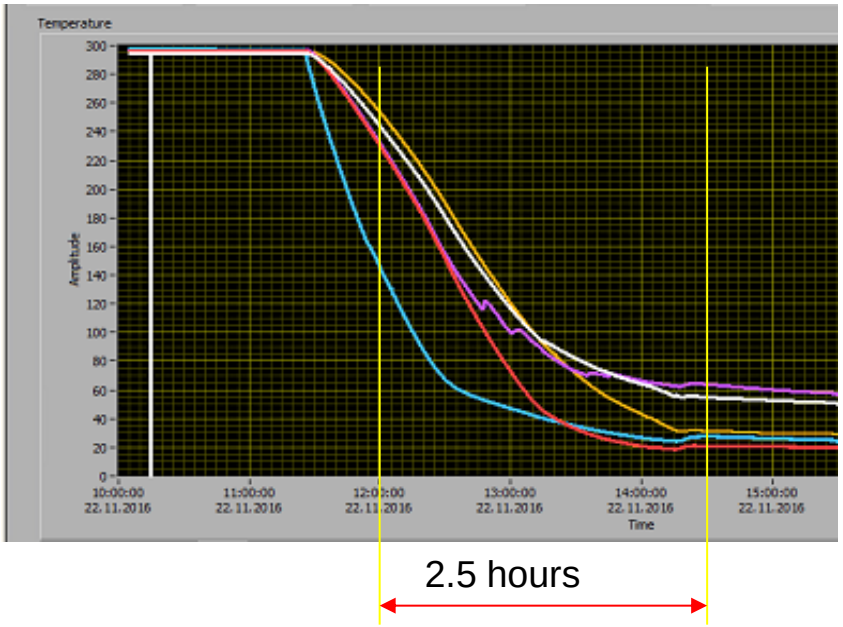
Results of construction changes

Temperature graphs during cooling procedure

Test 17.11.2015



Test 22.11.2016

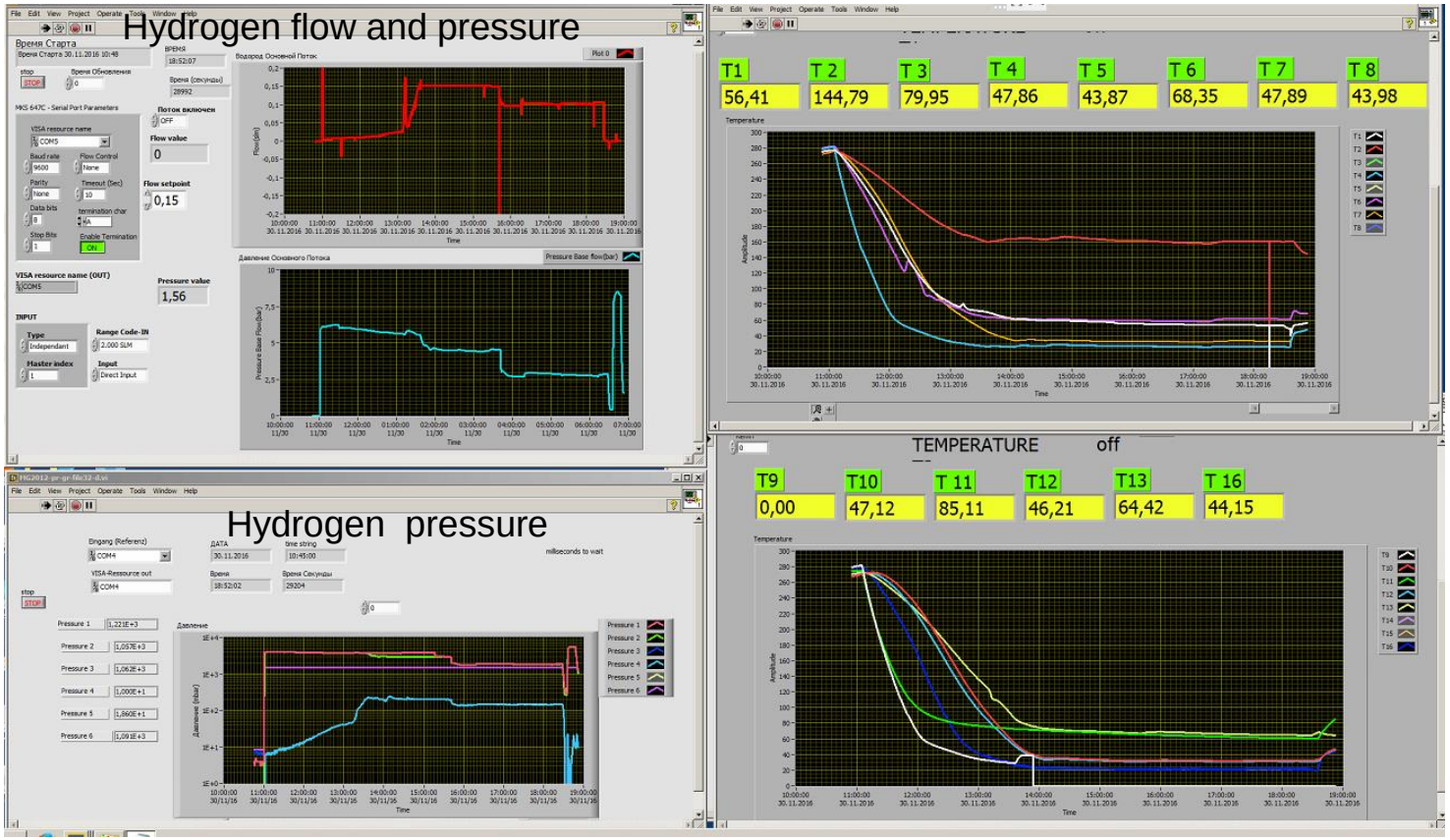


Results:

- cooling is going faster,
- temperature distributions are better

Results of construction changes

Test 30.11.2016



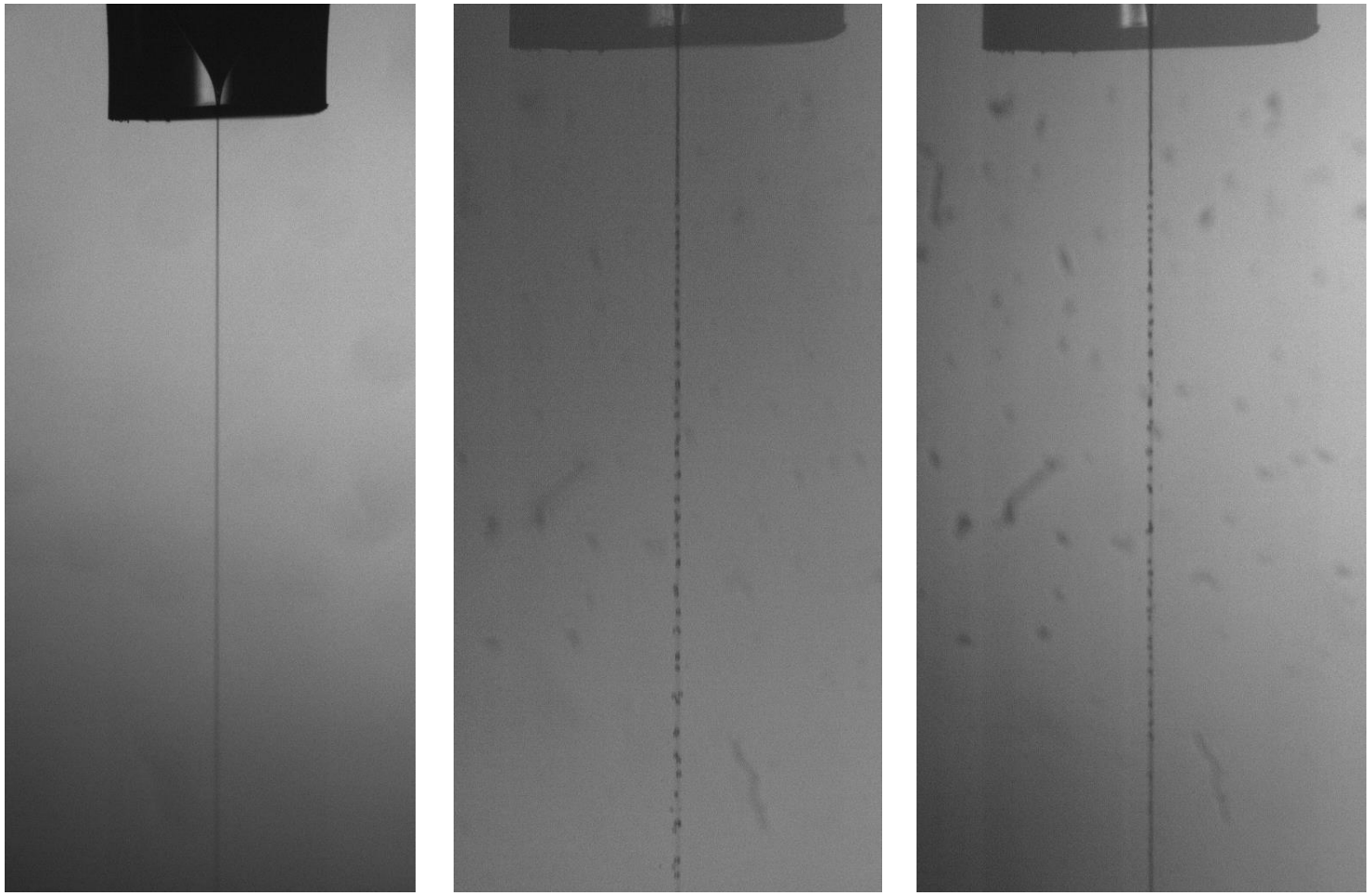
Results:

- more than 4 hours of stable operation per day
- Temperature distributions are better
- jet is more easy to control with the heaters and it is more stable

Cooling tests with hydrogen

Current result: 3 days of operation (3 cycles of cooling) without clogging of the nozzle

Test 30.11.2016



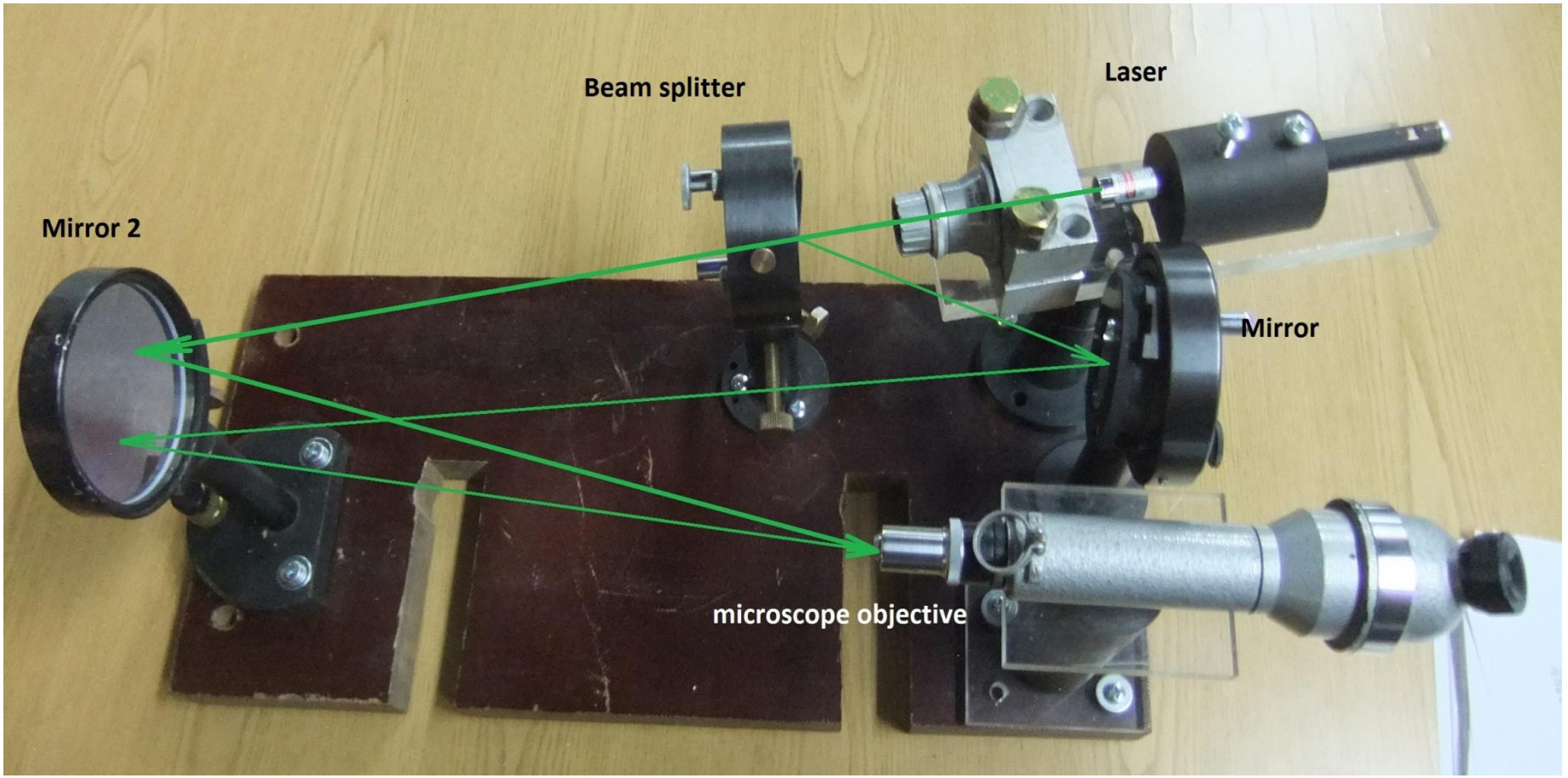
Nozzle Ø≈ 28 µm

Piezo generator operates not perfect

Status: jet and droplet production in the triple point chamber

Interference method for study of noise vibrations

Specially developed setup for monitoring of noise vibrations on the pellet target



Sensitivity of the method is ¼ λ = 0.12 μm

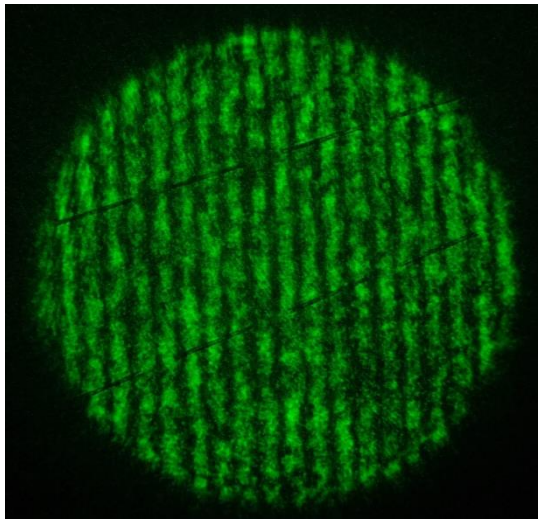
Interference method for study of noise vibrations

Setup was located on top of the pellet target.

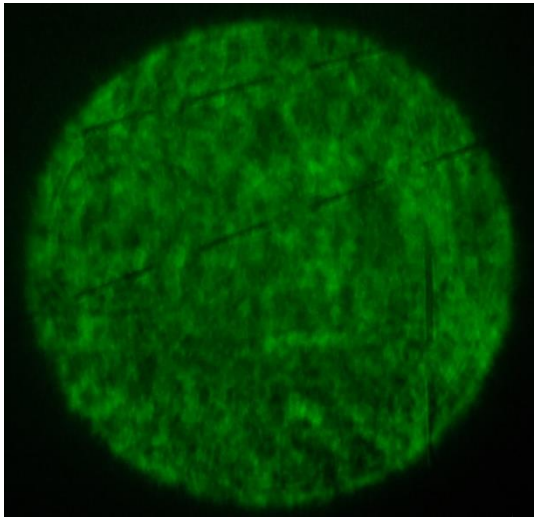
Consistent switch on each noise source

Interference method for study of noise vibrations

Interference pictures without and with noise vibrations

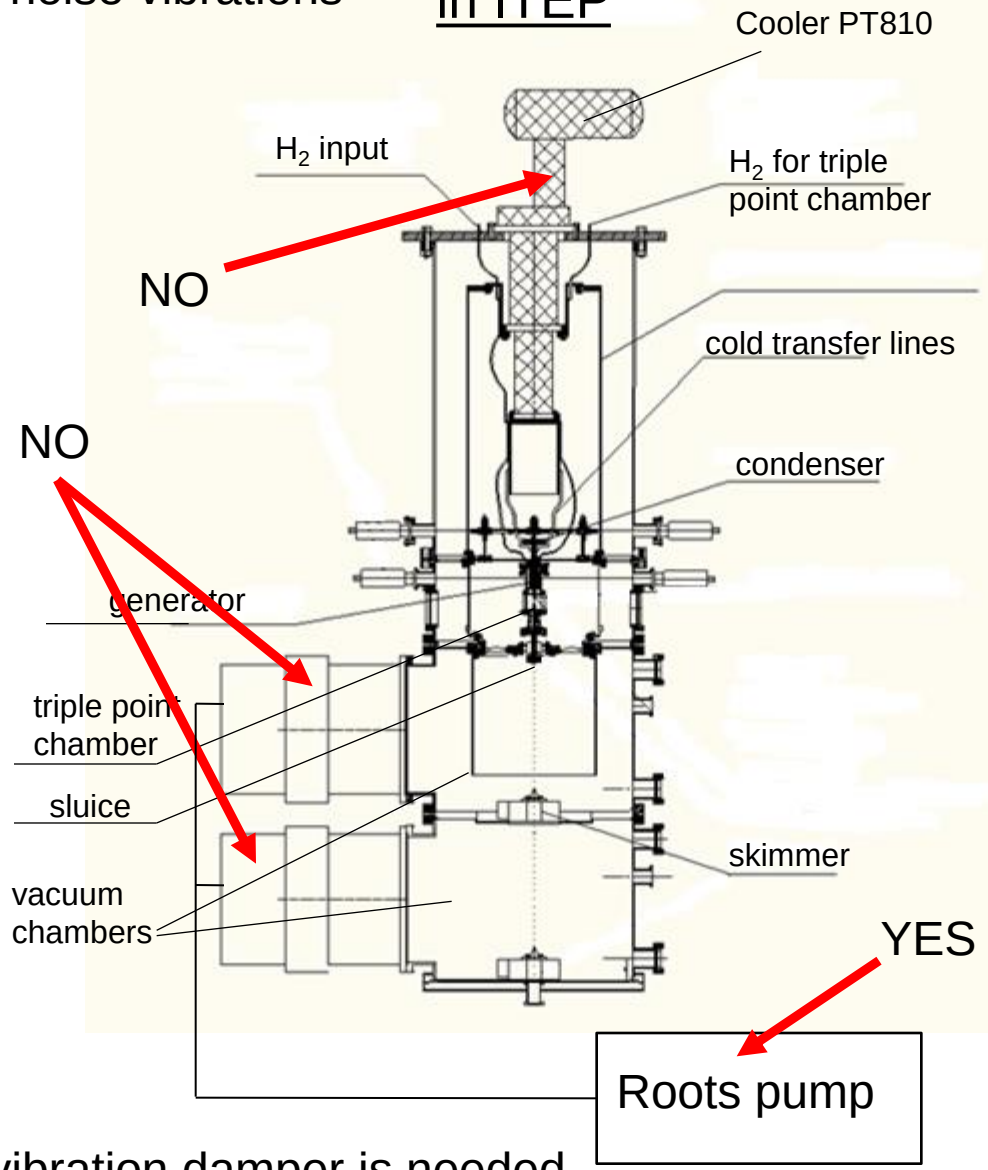


NO



YES

in ITEP



Result: for ROOTS pumps additional vibration damper is needed

Outlook

Current tasks:

- long time operation tests with various nozzle diameters
- selection of frequencies for monodisperse droplet production as function from parameters
- nozzle – sluice adjustment
- suppression of vibrations from ROOTS pump
- tests with MIFI on the water test station for interferometry diagnostics
- preparation documents for the target transfer from FZJ to ITEP