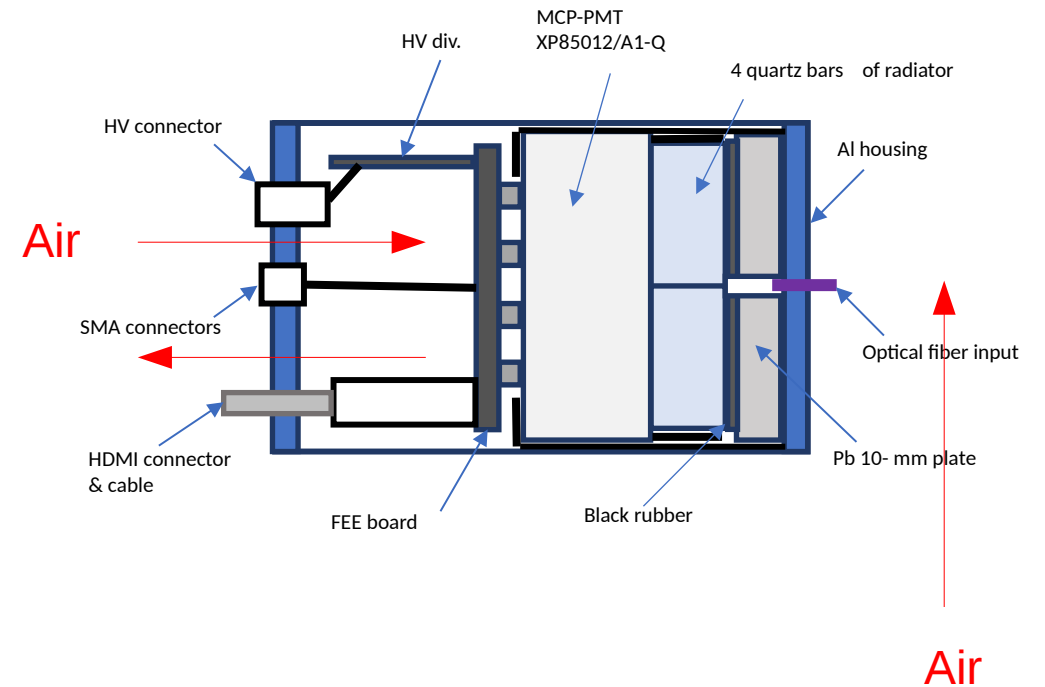
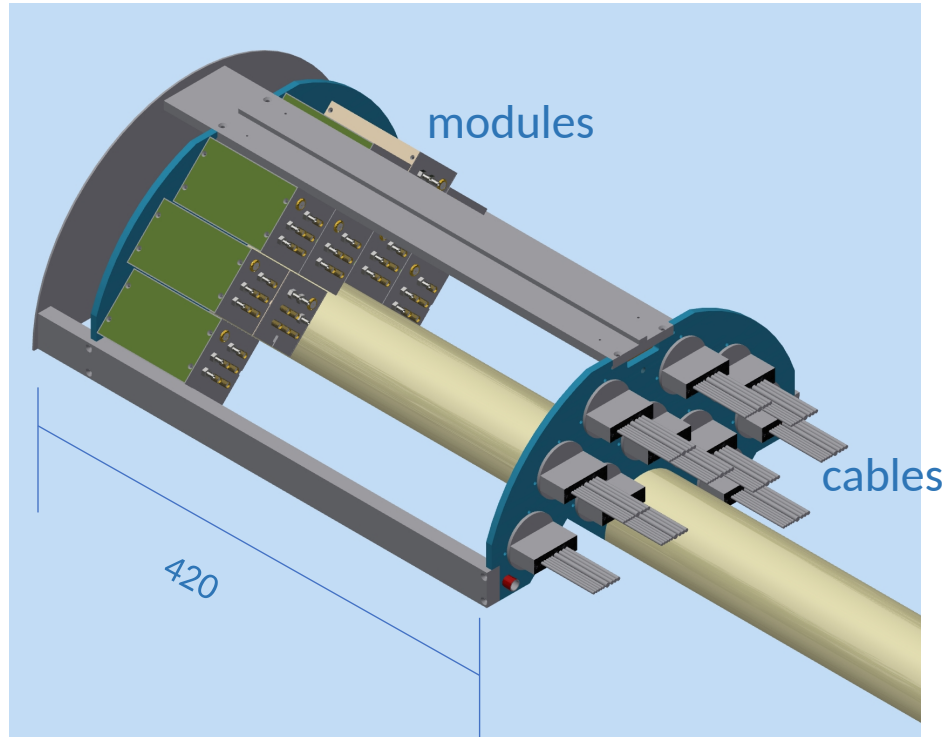


## Design of FFD detector (in progress together with ITS and beam pipe designers)



- Thermal shield between ITS and FFD Sub-Detectors  
3 mm Al + reflecting foil
- Air flow in every module
- Air flow in front of the modules

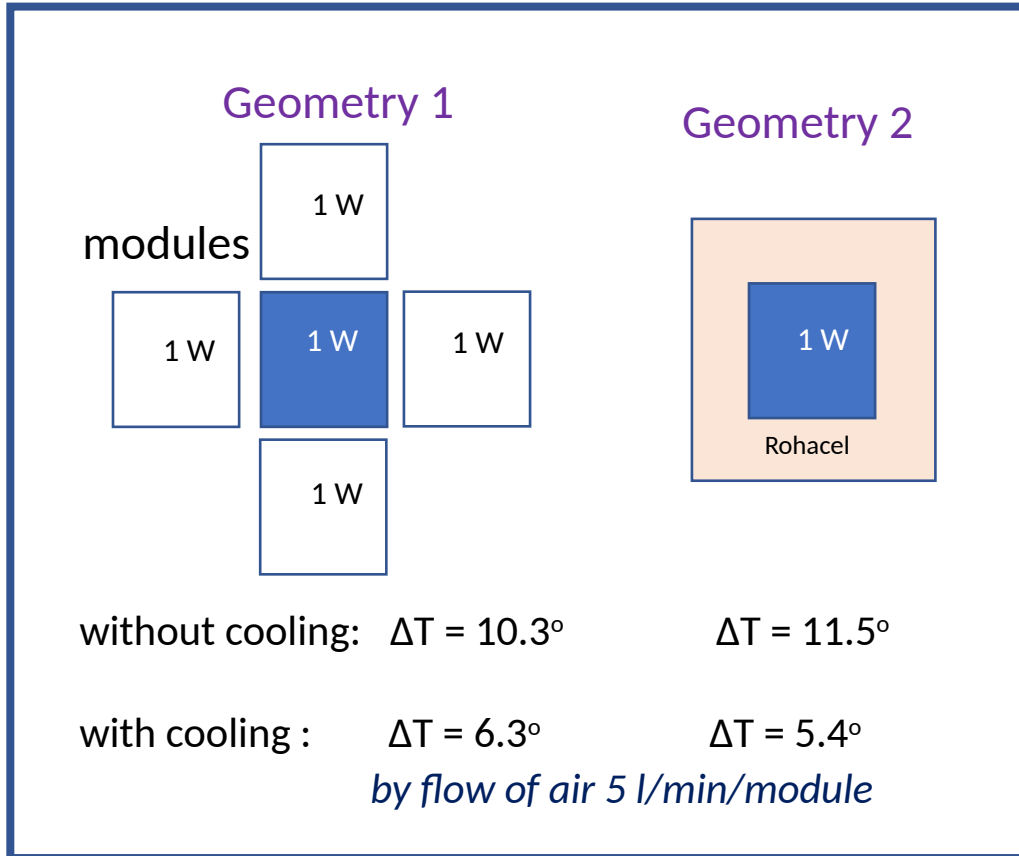
Tests in laboratory in Feb. - March 2019



Gas: air at room temperature

### Measurements

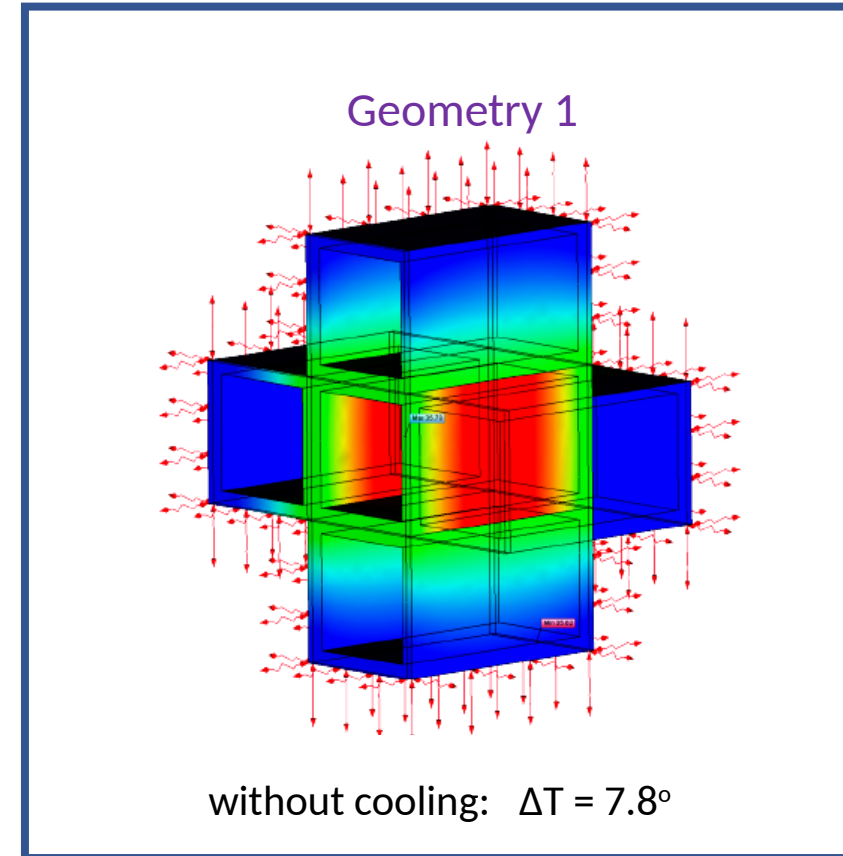
V. Tikhomirov



### Calculation

Program T-Flex CAD

N. Lashmanov



## Cooling procedure and requirements

- Power consumption of FEE: 0.8 W/module or 16 W/Sub-Detector
- Module temperature difference (inside - outside)  
$$\Delta T = T_{in} - T_{out} = 11^{\circ} \text{ C} \quad \text{without cooling}$$
$$= 6^{\circ} \text{ C} \quad \text{with cooling by air flow } 5 \text{ l/min/module}$$
- FFD requirement (max): 200 l/min/Sub-Detector of dry and cool air
- Special gas system will be used for automatic control of air flow
- Temperature sensors inside and outside FFD modules, (20+2)/Sub-Detector