

# **JINR plan for FCAL R&D**

JINR DLNP group status report and plans

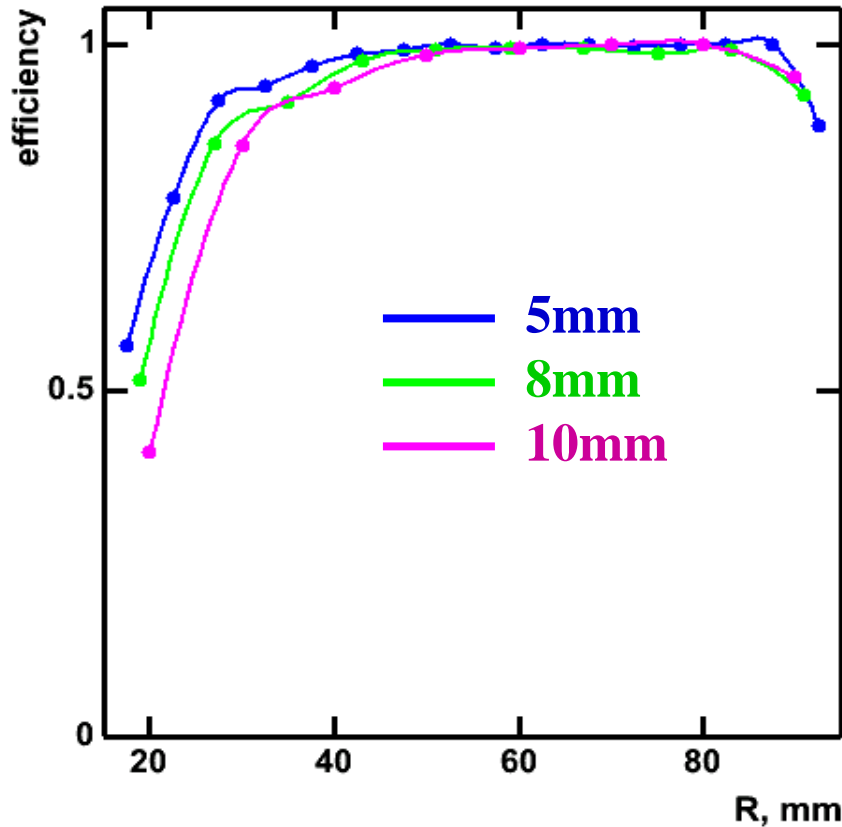
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## **Current JINR activities:**

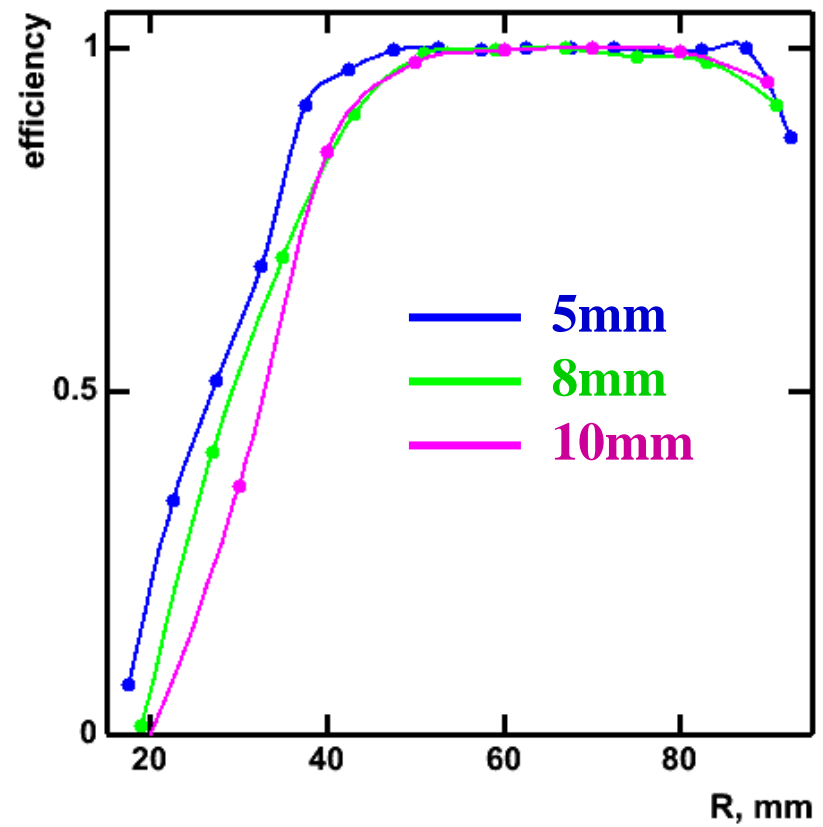
- **MC simulation for FCAL optimisation**
- **Hardware activities:**
  - a) - **Diamond sensor (CVD) option study**  
**continuation of R&D in cooperation**  
**with GPI (Moscow)**
  - b) - **Si sensor option study**
  - c) - **Infrastructure development**

# MC simulation for FCAL optimisation

Low BG ( $\varphi \sim 0^\circ$ )

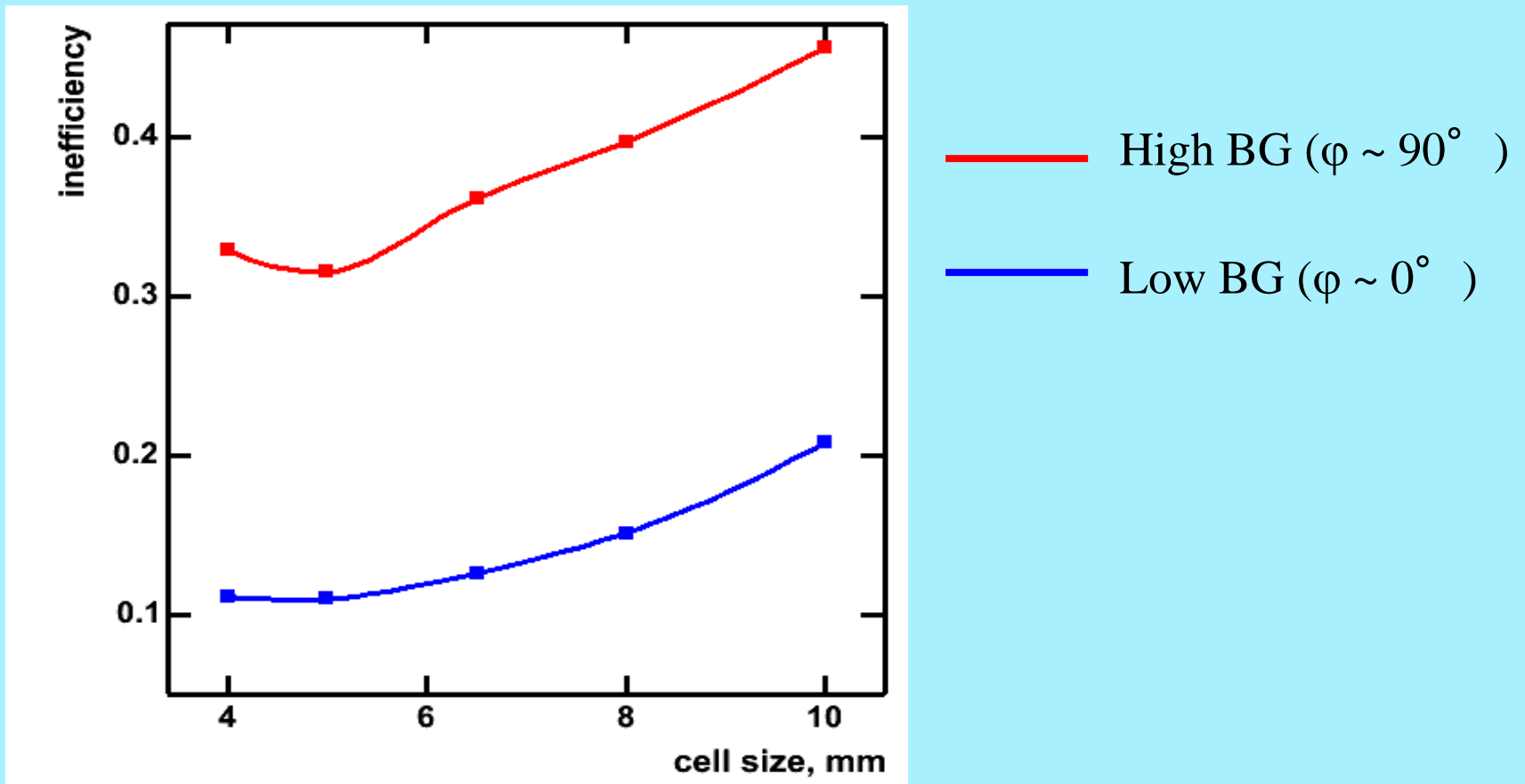


High BG ( $\varphi \sim 90^\circ$ )



# MC simulation for FCAL optimisation

Inefficiency to identify 200 GeV electrons ( $R < 55\text{mm}$ )



# Diamond sensor (CVD) option study

- Two new type of CVD foils (500 $\mu$  and 200 $\mu$  thickness ) was produced at GPI.
- At the end of September several samples (8x8)mm<sup>2</sup> should be delivered to Dubna after control measurement at GPI and metallization at Frjazino.
- After test of electrical characteristics and measurement with  $\alpha$ -source the samples ( in case of positive results) will be sent to Zeuthen for further investigations.
- There is plan to construct in GPI a new setup for CVD foils growing for detector R&D at the end of this year.

# Si sensor option study at JINR

The plan is to study a possibility of production Si sensors for FCAL in Russia:

- 1. Si sensor sector production at ELMA firm (Zelenograd, Moscow reg.) on the base of wafer from firm “Siltronic Wacker” (Germany).** ELMA has a good experience for Si sensor production for the ECAL preshower of CMS project at LHC and now for PHENIX forward calorimeter upgrade (RHIC, BNL) together with MSU group. The max wafer diameter now is 4”. There is a plan to start 6” wafer production at ELMA.
- 2. Incoming tests, cutting, contact wires welding, outgoing tests, performance study with  $\beta$ -source in DLNP JINR** (JINR has a good experience for Si sensor test and final assembling for CMS project)
- 3. Study a possibility of radiation test of samples at JINR microtone ( $E_e \text{Max} = 25 \text{ MeV}$ )** (test set up must be constructed)
- 4. Study a possibility of tungsten plate production in Russian industry.**

# Infrastructure development

- **The plan is to adopt existing large area clean room\* (6x18)m<sup>2</sup> for Si sensors production and testing.**
- **First two devices:**
  - **ultrasonic bonding (welding?) machine,**
  - **stand for electrical characteristics of Si measurements****was bought delivered and installed at clean room (see photo).**

\* - this clean room was constructed at DLNP for of ATLAS muon drift tube detectors assembling and will be available from the end of October

# Infrastructure





# Infrastructure



# Open questions

- FEE + DAQ electronics for Si sensors?
- Elaboration of Dubna group R&D plans (for example: test setup for sensor study with radioactive sources)
- Irradiation tests at the microtron.
- Financial sources?