

Performance of the BGO endcap calorimeter of the CMD-3 detector

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Abstract content

The BGO endcap calorimeter was successfully operated in the CMD-2 detector at the VEPP-2M collider. It consists of 680 BGO crystals each with a size of $25 \times 25 \times 150 \text{ mm}^3$, arranged in two identical endcaps, with a total crystal weight of 450 kg. The light readout used vacuum phototriodes. The endcap calorimeter has now been upgraded to work in the CMD-3 detector at new collider VEPP-2000. The major part of the endcap calorimeter, the BGO crystals, remains the same. The main upgrade is the use of silicon PIN photodiodes and new electronics. Main reason to change photosensitive device is the strong non-uniform magnetic field in the endcap calorimeter volume and reduced available space. The Hamamatsu PIN photodiode S3590-08 was chosen as the optimal solution, as they are insensitive to magnetic fields and are both compact and stable. An order of magnitude larger capacitance of silicon photodiodes requires design and produce new custom electronics. The upgrade is expected to bring an overall improvement of parameters. The endcap calorimeter has been installed in the detector and participates in data taking which started at 2010. The preliminary energy resolution is measured in the energy range 160-1000 MeV. It is better compare to the CMD-2 detector.

Summary

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