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# The Electromagnetic Calorimeter of the BelleII experiment at SuperKEKB and its upgrade.

The upgrade of the KEKB  $e^+e^-$  collider to SuperKEKB and of the Belle detector to BelleII has just been completed at KEK (Tsukuba, Japan) and the accelerator is starting the Phase2 operations on March 2018 for a new experiment with high luminosity up to  $8 \times 10^{35} \text{cm}^{-2}\text{s}^{-1}$ .

We report on the upgrade of the electromagnetic calorimeter (ECL) which will provide good energy and time resolution in a high background environment. The Belle calorimeter is based on 8736 CsI(Tl) crystals with PIN diodes used as photodetectors. The electronics has been modified to shorten the shaping time from  $1 \mu\text{s}$  to 500 ns in order to reduce the signal from pile-up events and provide pipeline readout of ECL information with further waveform analysis and readout data in FPGA. An algorithm of wave shape analysis reconstructs the amplitude and time of the signal. The calorimeter is also exploiting a new method based on Pulse Shape Discrimination (PSD) to distinguish between the signal produced in CsI(Tl) crystals by heavily-ionising particles and photons.

The second stage of the ECL upgrade includes a replacement of the forward endcap CsI(Tl) crystals with pure CsI with Photopentodes or Avalanche Photodiodes readout. Measurements with new electronics and results obtained with a prototype are presented.

## Secondary topics

## Applications

## Primary topic

Crystals

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