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## **K long and muon system for the Belle II experiment**

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### **Content**

A new K0L and muon detector based on scintillators will be used in the Belle II experiment, currently at the final stages of construction. The increased luminosity of the e+e- SuperKEKB collider entails challenging detector requirements. Relatively inexpensive polystyrene scintillator strips with wavelength shifting fibers ensure a sufficient light yield at the Silicon PhotoMultiplier (SiPM) photodetector, are robust and provide improved physics performance for the Belle II experiment compared to its predecessor, Belle.

### **Summary**

We have studied a system based on scintillator counters with WLS fiber light collection and SiPM readout for the Belle II experiment. We have identified a few simple improvements in the strip production technology which allow significant increases in the light collection efficiency, thus increasing the efficiency and robustness of the entire detector. The new system should work efficiently at background rates and radiation doses ~100 times larger than those observed for the Belle experiment. As demonstrated by many tests, the system has sufficient robustness to operate well in a strong magnetic field and high radiation and interaction environment with no significant degradation anticipated after many years of data-taking. While this system was designed for a particular experiment, namely Belle II, our study can be applied to the construction of muon systems in many experiments

**Primary author(s) :** Dr. UGLOV, Timofey (MIPT and LPI RAS)

**Presenter(s) :** Dr. UGLOV, Timofey (MIPT and LPI RAS)

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