

Development of Single-sided Silicon Detectors in the Emulsion-Hybrid System at J-PARC

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In the upcoming experiment at the J-PARC K1.8 beam line called E07, Systematic Study of Double Strangeness System with an Emulsion-Counter Hybrid System, nuclear emulsion detector plays a major role in studying the behavior of hypernuclei with strangeness $S = -2$. However, the nuclear emulsion detector is not efficient by itself because of its enormously huge data size requiring a long time for analysis. In order to supplement this disadvantage, an emulsion hybrid system was designed and is now being prepared for the E07 experiment at J-PARC.

In the hybrid system, the positions of events of our interest are predicted by counters and tracking detectors so that only small fractions of emulsion plates have to be analyzed. Among those detectors, single-sided silicon detectors (SSDs) play the most important role by giving the information of vertex positions on the emulsion plates with high precision because SSDs have high position resolution around $15 \mu\text{m}$. From the vertex position information, the areas to be analyzed on the emulsion plates are significantly reduced resulting in a short analysis time. The SSDs are now being developed at J-PARC and the expected performance and the status of them will be presented.

References

[1] K. Nakazawa et al., J-PARC E07 proposal.