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Preparation Status of Missing-Mass Spectroscopy for Ξ Hypernuclei with S-2S magnetic spectrometer

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At K1.8 beam line in the Hadron Hall of J-PARC, high-precision missing-mass spectroscopy for Ξ hypernuclei (J-PARC E70 experiment) is in preparation. In the J-PARC E70 experiment, the high-intensity $1.8\ \mathrm{GeV}/c\ K^-$ meson beam will be used for production of Ξ hypernuclei ($^{12}_{\Xi}$Be) via (K^-, K^+) reaction. A newly installed magnetic spectrometer "S-2S" has a high momentum resolution $\Delta p/p = 6.0 \times 10^{-4}$ (FWHM) which will enable high precision spectroscopy of Ξ hypernuclei with energy resolution of less than 2 MeV (FWHM).
As well as the S-2S magnets, we install an active fiber target as ^{12}C target, multi wire drift chambers (MWDC), particle-identification (PID) counters. The active fiber target consists of scintillation fibers and prevents energy straggling from getting resolution worse. MWDCs are installed at upstream and downstream sides of the S-2S magnets to detect K^+ track. Detected K^+ tracks give momenta of K^+. Not only K^+ but also a huge number of protons and π^+s as background events pass through S-2S. Thus we need to suppress these backgrounds with PID counters: aerogel Cherenkov counter for π^+ suppression, water Cherenkov counter for proton suppression and Time-of-Flight (ToF) counter for offline PID. Preparation of these detectors is currently in progress for beamtime which will begin from January 2023. In this talk, I will present detector specifications and a preparation status of the above detectors.

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