Summary Report of the Meeting on the Noise Issues of BESIII MDC

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On January 11, 2025, the Experimental Physics Division organized a meeting on the noise issues in the upgrade of BESIII inner tracker, with the participation of the Italian project team and the invited experts. The meeting was held in the BESIII control room. Mingyi Dong, on behalf of the project team, first introduced the current status of the noise issues in the stepped part of the drift chamber, as well as the measures and tests taken for the noise after last meeting: (1) When CGEM patch cards were disconnected to the long cables, the noise in MDC totally disappeared. (2)After installation of the shielding boxes for CGEM patch cards and MDC preamplifiers, the baseline noise was decreased, and the noise almost disappeared when CGEM was powered off, but when the CGEM was powered on, the huge noise came back.

After discussions among the expert group regarding the experimental test results, it was confirmed that the noise came from the CGEM electronics. Some additional measures and tests were proposed: (1) Adding a shielding layer on the HV patch cards of CGEM. (2) Further improving the shielding of the first step of MDC, especially the gap between the shielding layer and MDC flange2. (3) Since the stepped part of MDC involves triggering, cosmic-ray tests should be conducted with trigger signals only coming from MDC to evaluate the impact of noise on triggering. (4) If the noise cannot be resolved, other solutions should be considered, such as changing the MDC time measurement method to reduce the interference of noise.