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Study of cluster states via invariant-mass spectroscopy

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We will report on the progress of the SAMURAI08 experiment. In this experiment, alpha-cluster levels in ^{16}C were investigated with a 200 MeV/u ^{16}C beam and a liquid He target. The four momenta of decay particles (alpha particle, neutrons and residuals) were measured by the SAMURAI spectrometer. The gamma-rays from the decay particles were also detected by DALI2. We will report the results of some important decay channels such as $^{12}\text{Be} + \alpha$ and $^{11}\text{Be} + \alpha + n$. We will also discuss the future perspective of invariant-mass spectroscopy with alpha particle.

In terms of analysis, tracks of two charged particles in single event are needed to reconstruct their four momenta. The analysis method to obtain the two tracks in FDC1 and FDC2 is mainly reported.

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