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On the structure observed in the in-flight 3He (K^- , Lambda p) n reaction at J-PARC

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Recently, a peak structure was observed near the K^- p p threshold in the in-flight 3He (K^- , Lambda p) n reaction of the E15 experiment at J-PARC. This peak could be a signal of the lightest kaonic nuclei, that is, the Kbar N N (I=1/2) state, which has been intensively studied both experimentally and theoretically in the last decade. In this contribution we theoretically investigate what is the origin of the peak structure observed in the E15 experiment at J-PARC. Since the peak exists near the K^- p p threshold, we expect two scenarios to produce the peak. One is that the Lambda(1405) is generated but it does not correlate with p, and the uncorrelated Lambda(1405)-p system subsequently decays into Lambda p. The other is that the Kbar N N quasi-bound state is indeed generated and decays into Lambda p. We calculate the Lambda p invariant mass spectrum of the reaction with these two scenarios and compare it with the experimental one to interpret the experimental peak structure.

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