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High-energy spin excitations in heavily hole-doped superconductor KFe_2As_2 KAZUMASA HORIGANE, Aoyama-Gakuin University, CHUL-HO LEE, KUNIHIRO KIHOU, National Institute of Advanced Industrial Science and Technology, KAY FUJITA, Aoyama-Gakuin University, RYOICHI KAJIMOTO, J-PARC Center, SUNGDAE JI, Max Planck POSTECH/Korea Reseach Initiative, YASUHIRO INAMURA, MASATOSHI ARAI, J-PARC Center, JUN AKIMITSU, Aoyama-Gakuin University — The understanding of overall spin dynamics over the wide hole doping region is a key to progress in the study of iron based superconductors. In contrast to experimental works in parent compounds, spin dynamics in over hole doping region is not yet provided. In this research, we have performed inelastic neutron scattering of heavily hole-doped KFe_2As_2 at 4SEASONS. We revealed a well-defined low-energy incommensurate spin fluctuation at (0.32, 0.32) and (0.68, 0.68). This incommensurability was consistent with the previous triple-axis neutron scattering study. A practically vertical dispersion was discovered up to 80meV and spin fluctuations clearly exist even in heavily hole doped KFe_2As_2. The energy dependence of dynamical magnetic susceptibility χ(q,w) can be explained by a phenomenological function applicable to correlated spin system in Fermi liquid without magnetic long-range ordering. Therefore, magnetism in KFe_2As_2 likely originates from itinerant nature.

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