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Supression of superconductivity in $CeRh_{1-x}Co_xIn_5$ by incommensurate antiferromagnetic order SEIKO OHIRA-KAWAMURA, Ochanomizu Univ., HIROAKI SHISHIDO, Kyoto Univ., AKARI YOSHIDA, Ochanomizu Univ., RYUJI OKAZAKI, Kyoto Univ., HAZUKI KAWANO-FURUKAWA, Ochanomizu Univ., TAKASADA SHIBAUCHI, Kyoto Univ., HISATOMO HARIMA, Kobe Univ., YUJI MATSUDA, Kyoto Univ. — $CeCoIn_5$ shows superconductivity (SC) below 2.3 K, while the SC is highly suppressed in a related system $CeRhIn_5$, which exhibits the antiferromagnetic (AF) order below 3.8 K. Then the mixed compound $CeRh_{1-x}Co_xIn_5$ is expected to have a complex x-T phase diagram where the SC and magnetism coexist. In order to understand the relationship between the SC and the antiferromagnetism in $CeRh_{1-x}Co_xIn_5$, we have performed neutron diffraction measurements on this system for various x. A commensurate (C) AF order with a propagating vector $\boldsymbol{q}_c = (1/2, 1/2, 1/2)$ is observed for $0.3 \leq x \leq 0.6$, coexisting with the SC. However, they are strongly suppressed at $x \sim 0.3$, and an incommensurate (IC) AF order with $\boldsymbol{q}_I = (1/2, 1/2, 0.298)$ simultaneously appears. We interpret that there is no intrinsic coexistence between the IC- and C-AF orders and that the SC competes with the IC-AF order but coexists with the C-AF one. These results imply that particular areas on the Fermi surface nested by $\boldsymbol{q}_I$ play an active role in forming the superconducting state in $CeCoIn_5$.

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