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Observation of field-induced Fermi surface reconstruction in CeRhIn5 HUIQIU YUAN, LIN JIAO, ZONGFA WENG, YE CHEN, Zhejiang Univ, FRANK STEGLICH, Zhejiang Uni/Max-Planck Institute for Chemical Physics of Solids, DAVID GRAF, Florida State University, JOHN SINGLETON, MARCELO JAIME, ERIC BAUER, JOE THOMPSON, Los Alamos National Lab — CeRhIn5 provides a prototype compound for studying quantum criticality and its interplay with superconductivity. Application of pressure suppresses the antiferromagnetic (AF) order and gives rise to superconductivity [1]. A sharp change of Fermi surface was observed just at the pressure-tuning AF quantum critical point (QCP) [2], which was argued to support the scenario of local quantum criticality [3]. By measuring the dHvA oscillations and specific heat in a pulsed magnetic field, we have demonstrated the existence of a field-induced AF QCP around Bc0=50T in this compound [4]. In this presentation, we will report the measurements of dHvA effect and Hall resistivity of CeRhIn5 performed by using the 45T hybrid magnet and the pulsed field magnet at NHMFL. Field-induced changes of the dHvA frequencies and Hall coefficient are observed around B*=31T. Detailed analyses suggest that the Fermi surface reconstruction at B* corresponds to a localized-itinerant transition of Ce 4f-electrons attributed to the Kondo effect. Our results indicate that multiple quantum phase transitions may exist in CeRhIn5 which can be classified by the measurements of Fermi surface topology. [1] T. Park et. al., Nature 440, 65 (2006). [2] H. Shishido et. al., J Phys Soc Jpn 74,1103 (2005). [3] Q. Si, F. Steglich, Science 329,1161 (2010). [4] L. Jiao et al., arXiv:1308.0294.

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