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Quantum oscillations study of the Fermi-surface evolution in Yb-substituted $CeCoIn_5$ BOBBY PRÉVOST, Département de physique, Université de Montréal, Montréal, QC, Canada, ANDREY POLYAKOV, OLEG IGNATCHIK, Hochfeld-Magnetlabor Dresden (HLD), Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany, SIMON BLACKBURN, ANDREA D. BIANCHI, MICHEL CÔTÉ, GABRIEL SEYFARTH, Département de physique, Université de Montréal, Montréal, QC, Canada, DANIEL HURT, ZACHARY FISK, Department of Physics & Astronomy, University of California Irvine, Irvine, CA, USA, ROY G. GOODRICH, Department of Physics, George Washington University, Washington, DC, USA, JOCHEN WOSNITZA, Hochfeld-Magnetlabor Dresden (HLD), Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany — We report results of systematic de Haas-van Alphen (dHvA) studies on $Ce_{1-x}Yb_xCoIn_5$ single crystals with varying Yb concentrations x. For a low dilution of $x = 0.1$, the well-documented Fermi surface and the heavy effective masses of $CeCoIn_5$ ($x = 0$) remain nearly unchanged. A clear change of the Fermi-surface topology becomes evident for high Yb concentrations of $x = 0.55$, and above. The effective masses are reduced considerably to values between 0.7 and 2.6 free electron masses. Nevertheless, the superconducting transition temperature T_c and upper critical field H_{c2} are only weakly suppressed with x. The angular-resolved dHvA frequencies for $YbCoIn_5$ show a good agreement with our density functional theory band-structure calculation with localized $4f$ electrons and an Yb valence of 2+, which has been used to constructed the Fermi surface.

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