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Multiband transport and nonmetallic low-temperature state of $\mathbf{K_{0.50}Na_{0.24}Fe_{1.52}Se_2}$ HYEJIN RYU, Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory, Upton, New York 11973, USA, F. WOLFF-FABRIS, Hochfeld-Magnetlabor Dresden (HLD), Helmholtz-Zentrum Dresden-Rossendorf, D-01314 Dresden, Germany, J.B. WARREN, Instrument Division, Brookhaven National Laboratory, Upton, New York 11973, USA, M. UHLARZ, J. WOSNITZA, Hochfeld-Magnetlabor Dresden (HLD), Helmholtz-Zentrum Dresden-Rossendorf, D-01314 Dresden, Germany, C. PETROVIC, Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory, Upton, New York 11973, USA — We report evidence for multiband transport and an insulating low-temperature normal state in superconducting $K_{0.50}Na_{0.24}Fe_{1.52}Se_2$ with $T_c \approx 20$ K. The temperature-dependent upper critical field H_{c2} is well described by a two-band model. After the superconductivity is suppressed by applying pulsed magnetic field at low temperature, the normal-state resistance is found to increase logarithmically as $T \to 0$. This is similar as for high-T_c copper oxides and granular superconductors, suggesting that the superconductor-insulator transition is related to intrinsic nanoscale phase separation.

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