

## Observation of a Small Superconducting Energy Gap in $\text{K}_{0.7}\text{Fe}_{1.8}\text{Se}_2$ by Optical Spectroscopy

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We report an optical spectroscopy study on the newly discovered iron-selenide superconductor  $\text{K}_{0.7}\text{Fe}_{1.8}\text{Se}_2$ . In the far-infrared region, there is a clear signature of the superconducting energy gap with a gap ratio  $2\Delta/k_B T_c \sim 1.3$ , far below the usual weak-coupling BCS value. The large energy gap in the electron Fermi pockets observed by angle-resolved photoemission (ARPES) technique is completely absent in the infrared probe. The complex behavior may imply the presence of both dirty and clean channels of superconductivity. Our measurements also reveal a surprisingly low carrier density for the compound: both the carrier density in the normal state and the condensed carrier density in the superconducting state are about one order smaller than other iron-pnictide superconductors.