

# Two-band and pauli-limiting effects on the upper critical field of 112-type iron pnictide superconductors

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## 1. X-ray diffraction result

The single crystal x-ray diffraction (XRD) was performed using a Rigaku diffractometer with Cu  $K\alpha$  radiation. Fig.S1. shows the single crystal XRD pattern of  $\text{Ca}_{0.83}\text{La}_{0.17}\text{FeAs}_2$  and  $\text{Ca}_{0.8}\text{La}_{0.2}\text{Fe}_{0.98}\text{Co}_{0.02}\text{As}_2$ . It crystalized in a monoclinic crystal structure with a space group of  $P_{21}$ . Only (00 $l$ ) diffraction peaks were observed, indicating good  $c$ -axis orientation.

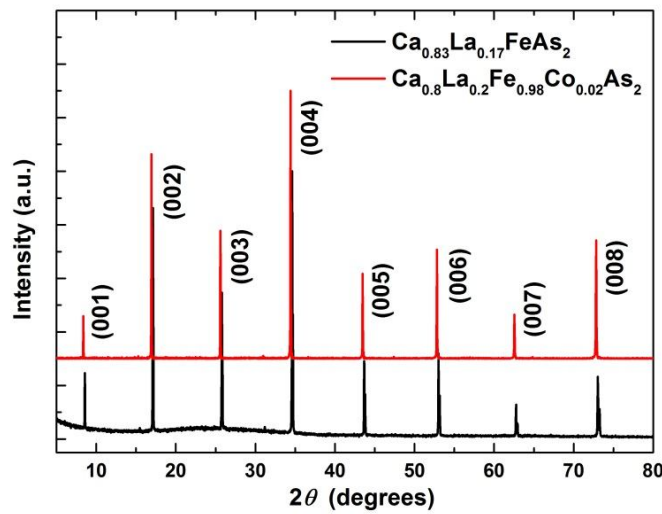


Fig. S1. X-ray diffraction pattern of  $\text{Ca}_{0.83}\text{La}_{0.17}\text{FeAs}_2$  and  $\text{Ca}_{0.8}\text{La}_{0.2}\text{Fe}_{0.98}\text{Co}_{0.02}\text{As}_2$  single crystals.

## 2. $\mu_0 H_{c2}$ - $T$ phase diagram

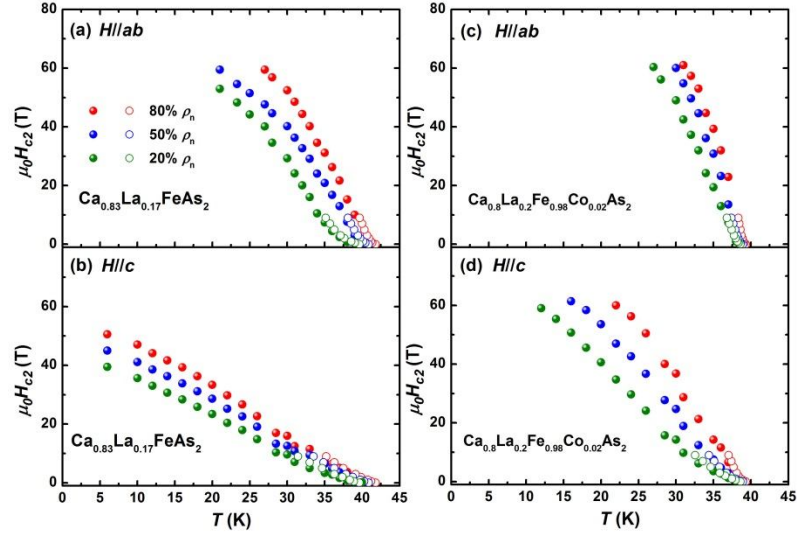


Fig. S2. Temperature dependence of the upper critical field  $\mu_0 H_{c2}(T)$  of  $\text{Ca}_{0.83}\text{La}_{0.17}\text{FeAs}_2$  for (a)  $H//ab$  and (b)  $H//c$ , and of  $\text{Ca}_{0.8}\text{La}_{0.2}\text{Fe}_{0.98}\text{Co}_{0.02}\text{As}_2$  for (c)  $H//ab$  and (d)  $H//c$  obtained from  $\rho(T)$  (open symbols) and  $\rho(H)$  (closed symbols) curves.

### 3. Schematic diagram

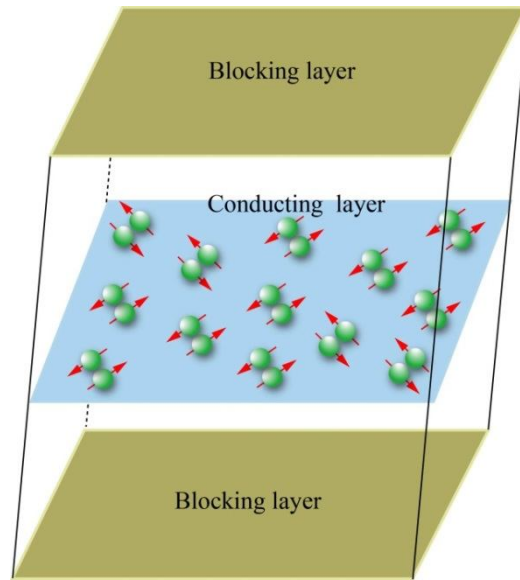


Fig.S3. The schematic diagram of spin-locked superconductivity in iron based superconductors. The blocking layer and conducting layer represent the CaAs layer and FeAs layer, respectively.