Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Universal V-shaped phase diagram in the iron-based superconductors XFe_2As_2 (X = K, Rb, Cs) ALEXANDRE OUELLET, FAZEL FALLAH TAFTI, ALEXANDRE JUNEAU-FECTEAU, SAMUEL FAUCHER, MAXIME LAPOINTE-MAJOR, NICOLAS DOIRON-LEYRAUD, LOUIS TAILLEFER, University of Sherbrooke, AIFENG WANG, XIGANG LUO, XIANHUI CHEN, University of Science and Technology of China — Following the discovery of a sharp reversal in the dependence of T_c on pressure in KFe_2As_2 [1] and $CsFe_2As_2$ [2], we report a similar behavior in $RbFe_2As_2$. The application of hydrostatic pressure initially decreases T_c until a critical pressure $P_c = 11$ kbar where T_c suddenly starts to increase. For the three materials, we find a universal V-shaped temperature-pressure phase diagram, with identical slopes $\frac{dT_c}{dP}$ below and above P_c. Upon crossing P_c, the upper critical field H_{c2} is observed to jump, by a similar factor for KFe_2As_2 and $RbFe_2As_2$. We interpret these universal features in terms of a pressure-induced change in the pairing state of these superconductors. [1] F. F. Tafti et al., Nature Physics 9, 349 (2013). [2] F. F. Tafti et al., Physical Review B 89, 134502 (2014).

Alexandre Ouellet
University of Sherbrooke

Date submitted: 14 Nov 2014 Electronic form version 1.4