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Spin-fluctuation induced non-Fermi-liquid behaviour with suppressed superconductivity in LiFe1-xCoxAs HU MIAO, YAOMIN DAI, Brookhaven National Laboratory, LINGYI XING, XIANCHENG WANG, Institute of physics, Chinese Academy of Sciences, PENGSHUAI WANG, Renmin University, HONG XIAO, TIAN QIAN, PIERRE RICHARD, XIANGGANG QIU, Institute of physics, Chinese Academy of Sciences, WEIQIANG YU, Renmin University, CHANGQING JIN, ZIQIANG WANG, Institute of physics, Chinese Academy of Sciences, P. D. JOHNSON, C. C HOMES, Brookhaven National Laboratory, HONG DING, Institute of physics, Chinese Academy of Sciences — We study a series of $LiFe_{1-x}Co_xAs$ compounds with different Co concentrations by transport, optical spectroscopy, angle-resolved photoemission spectroscopy, and nuclear magnetic resonance. We observe a Fermi-liquid to non-Fermi-liquid to Fermi-liquid (FL-NFL-FL) crossover alongside a monotonic suppression of the superconductivity with increasing Co content. In parallel to the FL-NFL-FL crossover, we find that both the low-energy spin fluctuations and Fermi surface nesting are enhanced and then diminished, strongly suggesting that the NFL behaviour in $LiFe_{1-x}Co_xAs$ is induced by low-energy spin fluctuations that are very likely tuned by Fermi surface nesting. Our study reveals a unique phase diagram of $LiFe_{1-x}Co_xAs$ where the region of NFL is moved to the boundary of the superconducting phase, implying that they are probably governed by different mechanisms.

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