

STM studies on lightly doped Mott/Slater Insulator $\text{Sr}_{2-x}\text{Eu}_x\text{IrO}_4$

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Sr_2IrO_4 is a $5d^5$ transition metal oxide with several similarities to cuprate systems. In particular this compound has an insulating behavior which has been explained as a spin-orbit assisted Mott insulator, and recently, to a mixture between Mott/Slater insulator. The withstanding controversy about the origin and size of the gap, the unclear effect of doping in the resistivity and the anomalies found on the temperature dependence of quantities such as magnetization of this system might be clarified with atomic resolution measurements of the electronic properties of the system.

With this motivation, we report Scanning Tunneling Microscopy/Spectroscopy measurements on lightly doped $\text{Sr}_{2-x}\text{Eu}_x\text{IrO}_4$. By obtaining atomic resolution images we have estimated the Eu doping concentration to be close to 0.3%. This dilute doping allows us to isolate the effect of individual doping atoms in the electronic structure of the material at nanometric scales.