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ABSTRACTS
dynamic nature of the fluctuations is not important and the quasi-particle dispersion exhibits the shadow feature like that induced by a static long range order. At lower energies, however, the shadow feature is pushed away by the finite ob. The detailed low energy features are determined by the bare dispersion and the coupling of quasi-particles to the dynamic fluctuations. We present how these factors reconstruct the Fermi surface to produce the Fermi arcs or the Fermi pockets, or their coexistence. Our principal result is that the dynamic nature of the fluctuations, without invoking a yet-to-be-established long range order, can produce the Fermi pocket centered away from the $(\pi,\pi,0)$ towards the zone center which may coexist with the Fermi arcs. This is discussed in comparison with the experimental observations.


**CP-05. A study on the extensive nano-twinning obtained in YBa2Cu3O7-CP-05. A study on the extensive nano-twinning obtained in**


**CP-06. Temperature-dependent Raman scattering of double perovskite**

E. Granado1 and J. Gopalakrishnan2,3

Ba2FeReO6 and Sr2CrReO6.

The structural and magnetic phase transition for LiFe$_x$Ni$_{1-x}$PO$_4$ has been investigated by the x-ray diffraction measurement and Mössbauer spectroscopy. Stoichiometric Li$_x$Fe$_{1-y}$Ni$_y$PO$_4$ (0.0$\leq y$0.6) polycrystalline powders were synthesized by the solid-state reaction method. Chemical oxidation to prepare the fully lithium deintercalated Fe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) was performed by reaction of Li$_x$Fe$_{1-y}$Ni$_y$PO$_4$ and NO$_2$BF$_4$ in acetonitrile [1]. Rietveld refinement of x-ray diffraction patterns of Li$_x$Fe$_{1-y}$Ni$_y$PO$_4$ (0.0$\leq$y$\leq$0.6) revealed that the lattice parameter of $a=4.692$ Å for LiFePO$_4$ linearly changed to $a=4.687$ Å for LiFe$_{0.4}$Ni$_{0.6}$PO$_4$ by the substitution of Ni ions. Also, the fully lithium deintercalated Fe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) series has same behavior of the change in lattice parameter with decrease of the unit cell volume by the lithium ion deintercalation. According to the temperature dependent magnetic susceptibility curves, the LiFe$_x$Ni$_{1-x}$PO$_4$ has an antiferromagnetic order with decrease of the magnetic Neel temperature ($T_N$) from 31 K for LiFePO$_4$ to 30 K for Fe$_{0.4}$Ni$_{0.6}$PO$_4$. Also, the magnetic order of fully deintercalated Fe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) has different antiferromagnetic order with decrease in $T_N$ from 11 K for FePO$_4$ to 10 K for Fe$_{0.4}$Ni$_{0.6}$PO$_4$ which coming from the spin-transition of Fe$^{2+}$/Fe$^{3+}$ and Ni$^{2+}$/Ni$^{3+}$ due to the lithium ion vacancy in olivine structure. The Mössbauer spectra show $\Gamma_{54}$ for Fe$_{0.4}$Ni$_{0.6}$PO$_4$ (x=0, 1, 0.0$\leq$y$\leq$0.6) were fitted with asymmetrical eight Lorentzian. The elastic quadrupole splitting value ($\Delta_{Q}$) of LiFe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) increases while Fe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) decreases with increasing Ni substitution. This can be explained by the concentration of Ni and Li ion can be affect on the charge distribution FeO$_6$ octahedral site.


**CP-07. Structural and magnetic phase transition of mixed olivines LiFe$_x$Ni$_{1-x}$PO$_4$ by lithium deintercalation.**

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The structural and magnetic phase transition for LiFe$_x$Ni$_{1-x}$PO$_4$ has been investigated by the x-ray diffraction measurement and Mössbauer spectroscopy. Stoichiometric Li$_x$Fe$_{1-y}$Ni$_y$PO$_4$ (0.0$\leq$y$\leq$0.6) polycrystalline powders were synthesized by the solid-state reaction method. Chemical oxidation to prepare the fully lithium deintercalated Fe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) was performed by reaction of Li$_x$Fe$_{1-y}$Ni$_y$PO$_4$ and NO$_2$BF$_4$ in acetonitrile [1]. Rietveld refinement of x-ray diffraction patterns of Li$_x$Fe$_{1-y}$Ni$_y$PO$_4$ (0.0$\leq$y$\leq$0.6) revealed that the lattice parameter of $a=4.692$ Å for LiFePO$_4$ linearly changed to $a=4.687$ Å for LiFe$_{0.4}$Ni$_{0.6}$PO$_4$ by the substitution of Ni ions. Also, the fully lithium deintercalated Fe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) series has same behavior of the change in lattice parameter with decrease of the unit cell volume by the lithium ion deintercalation. According to the temperature dependent magnetic susceptibility curves, the LiFe$_x$Ni$_{1-x}$PO$_4$ has an antiferromagnetic order with decrease of the magnetic Neel temperature ($T_N$) from 31 K for LiFePO$_4$ to 30 K for Fe$_{0.4}$Ni$_{0.6}$PO$_4$. Also, the magnetic order of fully deintercalated Fe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) has different antiferromagnetic order with decrease in $T_N$ from 11 K for FePO$_4$ to 10 K for Fe$_{0.4}$Ni$_{0.6}$PO$_4$ which coming from the spin-transition of Fe$^{2+}$/Fe$^{3+}$ and Ni$^{2+}$/Ni$^{3+}$ due to the lithium ion vacancy in olivine structure. The Mössbauer spectra show $\Gamma_{54}$ for Fe$_{0.4}$Ni$_{0.6}$PO$_4$ (x=0, 1, 0.0$\leq$y$\leq$0.6) were fitted with asymmetrical eight Lorentzian. The elastic quadrupole splitting value ($\Delta_{Q}$) of LiFe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) increases while Fe$_x$Ni$_{1-x}$PO$_4$ (0.0$\leq$y$\leq$0.6) decreases with increasing Ni substitution. This can be explained by the concentration of Ni and Li ion can be affect on the charge distribution FeO$_6$ octahedral site.


**CP-08. Photo carrier induced effects on the magnetic ground state of La(2)CuO(4).**

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The undoped mother compounds of the cuprate based high temperature superconductors are charge-transfer insulators (CTI) with a band gap of

K, and from 30 to 730 K, respectively, were performed. Ba2FeReO6 compound is an interesting material due to its half metallicity, large room temperature magnetoresistance, high Curie temperature of TC~305 K, and large spin polarization [1,2]. The crystallographic structure of this metallic compound presents cubic symmetry (space group Fm$ar{3}$m) at room temperature where the Fe3+ (3d5) and Re5+ (4d2) orbitals are in alternating FeO6 and Re6 octahedra [2,3]. Sr2CrReO6 has a high Curie temperature (TC = 635K). The crystal symmetry is tetragonal I4/mmm at room temperature [4]. The Raman spectra for Ba2FeReO6 showed three Raman active modes out of four at around 396, 497, and 582 cm-1. From temperature dependence of the Raman spectra, we observed a remarkable response of the phonon mode, associated to stretching vibration modes of the BO6 octahedra, at 582 cm-1 to the onset of the magnetic ordering phase at TC ~ 305 K, where the mode frequency hardens anomalously with decreasing temperature below TC. Interestingly, the phonon mode at 615 cm-1 of Sr2CrReO6, associated to stretching vibration modes, also presented an anomalous hardening below TC. This anomalous deviation of the phonon frequency for both double perovskites can be understood in terms of spin-phonon coupling mechanism.

**ABSTRACTS**

**FIG. 1. Micrographs obtained from a YBCO superconductor at different magnifications (a) 25kx and (b) 50 kx using a Field Emission Scanning Electron Microscope. Presence of nano-twins and crossing-twins in the sample can be seen.**

**CP-06. Temperature-dependent Raman scattering of double perovskite Ba2FeReO6 and Sr2CrReO6.**

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Raman scattering measurements on polycrystalline double perovskite Ba2FeReO6 and Sr2CrReO6 over a wide temperature range from 17 to 475...