



Experiment title: EXAFS study of lattice distortions in the $\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_{4+\delta}$ oxide superconductors	Experiment number: 08-01-076	
Beamline: GILDA	Date of experiment: from: 17/7/1997 to: 20/7/1997	Date of report: 29/8/1997
Shifts: 9	Local contact(s): Stefano Colonna	<i>Received at ESRF:</i> 1 SEP. 1997

Names and affiliations of applicants (* indicates experimentalists):

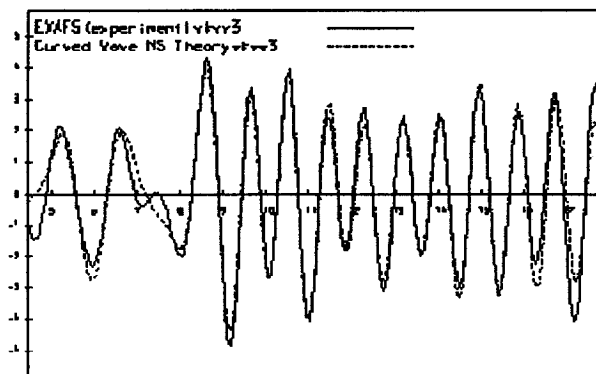
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Report:

EXAFS spectra near the Ce-K edge have been collected for the $\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_{4+\delta}$ ($x=0.05, 0.10, 0.15, 0.20$) oxide superconductors, and for samples having different oxygen contents. For the $x=0.15$ composition, that can give rise to superconductivity, spectra have been collected as a function of temperature as well, in the range $10 < T \text{ (K)} < 290$. For the rest of the samples, data have been collected at room temperature and at liquid nitrogen temperature. Although the data analysis is still in progress (the data collection has been carried out one month ago), some preliminary results are quite promising and seem to agree with previous Ce-L_{III} edge measurements [1]: the Ce-Nd substitution induces a relaxation of the coordination cage around the Ce atom. A typical EXAFS spectrum and the corresponding fitting parameters are reported in Fig. 1

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N4 1.0 14 4(ND) R4 3.578 A4 0.011
N5 4.0 15 4(ND) R5 3.744 A5 0.006
N6 4.0 16 4(ND) R6 4.000 A6 0.024
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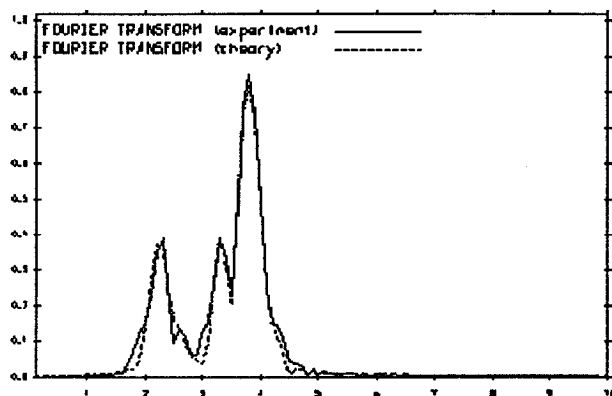


Fig. 1 EXAFS spectrum and Fourier transform of a $\text{Nd}_{1.80}\text{Ce}_{0.20}\text{CuO}_{4+\delta}$ sample, at room temperature. The fitting parameters are shown.

References

[1] P. Ghigna et al., *Physica C* 253, 147 (1995).