

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Raman investigation of the magneto-structural transition in electron doped Ba(FeAs)<sub>2</sub>**<sup>1</sup> YANN GALLAIS, LUDIVINE CHAUVIERE, MAXIMILIEN CAZAYOUS, MARIE-AUDE MEASSON, ALAIN SACUTO, Universite Paris Diderot, DOROTHEE COLSON, ANNE FORGET, SPEC CEA Saclay — We report a doping dependent Raman scattering study of the magneto-structural transition in Co doped Ba(FeAs)<sub>2</sub>. Several zone centered phonons display significant anomalies at the tetragonal to orthorhombic transition. In particular, the doubly degenerate in-plane E<sub>g</sub> phonon shows an enhanced splitting in the ortho phase. The splitting weakens considerably with doping and gives evidence for strong spin-phonon coupling in iron-pnictides. The electronic Raman continuum displays a systematic upturn at low energy around the magneto-structural transition. This quasi-elastic scattering is similar to magnetic energy fluctuations usually observed in magnetic insulators. Interestingly significant fluctuations are observed at low temperature even for x=0.065 doping, where the Neel temperature goes to zero and optimal T<sub>c</sub> is reached. At high energy and low doping, the electronic Raman continuum displays clear signatures Fermi surface reconstruction due to the opening of the spin density wave gap at the magnetic transition.

<sup>1</sup>Work funded by Agence Nationale de la Recherche (ANR).

Yann Gallais  
Universite Paris Diderot

Date submitted: 14 Dec 2010

Electronic form version 1.4