Raman investigation of the magneto-structural transition in electron doped $\text{Ba(FeAs)}_2$\textsuperscript{1} YANN GALLAIS, LUĐIVINE CHAUVERIE, 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)$_2$. Several zone centered phonons display significant anomalies at the tetragonal to orthorhombic transition. In particular, the doubly degenerate in-plane $E_g$ 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 $T_c$ 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.

\textsuperscript{1}Work funded by Agence Nationale de la Recherche (ANR).