

Abstract Submitted  
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**Magnetic and lattice coupling in the  $AFe_2As_2$  ( $A=Ca, Ba, \text{ and } Sr$ ) compounds**<sup>1</sup> HAIFENG LI, DAVID VAKNIN, JEREL ZARESTKY, WEI TIAN, ANDREAS KREYSSIG, NI NI, SERGEY BU'DKO, PAUL CANFIELD, ROBERT MCQUEENEY, ALAN GOLDMAN, Ames Laboratory and Physics Department and Astronomy, Iowa State University, Ames, IA — Systematic elastic and inelastic neutron scattering studies of the  $AFe_2As_2$  ( $A=Ca, Ba, \text{ and } Sr$ ) compounds reveal some common and distinguished properties that may shed light on the nature of the coupling between the magnetic and lattice degrees of freedom. We find, that for all three samples, the structural and antiferromagnetic (AFM) transition temperatures coincide within the experimental uncertainty of measurements. We also find that the AFM propagation vector is unequivocally along the long  $a$ - orthorhombic axis for all three compounds. The coupling between the magnetic and chemical structure is in play below the transition down to the lowest temperatures. More results and discussion on the nature of the transitions will be presented.

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