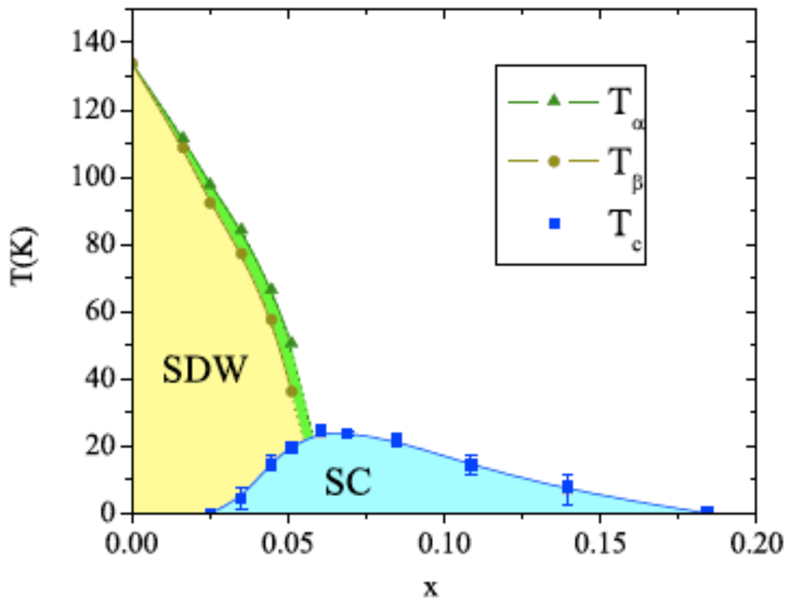


FIG. 15: The Phase diagram of Co-doped FeAs2 [90], [91]. The green triangles mark the transition to an altered structure while the black circles mark the antiferromagnetic transition. Superconducting region is shown in blue.

pairing, as has been suggested [92–94]. As discussed earlier, AFM fluctuations would favor such a symmetry of pairing for an appropriate fermi-surface; the form of the fermi-surface in this class of compounds is the right kind. Given the phase diagram, it is also reasonable to infer that the AFM/structural quantum-criticality is responsible for the high transition temperatures. But as discussed above, the Gaussian quantum-criticality is bad for $T_c$, both due to the prefactor and the inelastic scattering, especially for the case of pairing not of the simple s-wave variety. The important question therefore is the nature of the quantum-critical fluctuations. Only a limited set of experiments are at present available on good single crystals to answer this question and no conclusive statements can be made yet.

Two experiments suggest that quantum-criticality may be in the same universality class as the Cuprates, i.e. the fluctuations have a weak low frequency singularity and a broad nearly constant distribution in frequency. One is the measurement of thermopower for hole doped compound to deduce the electronic contribution to entropy in the normal state, see fig. (16) and the other is the resistivity measurements, also shown in the same figure but for