

Muon spin relaxation: probing critical questions in high- T_c superconductivity

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With a few provisos some key questions around high- T_c superconductivity are more or less resolved. Foremost of these is the predominant d -wave symmetry of the order parameter and its attendant impact on the temperature dependence of superfluid density and the effect of impurity scattering. Here a consistent picture emerges which draws together the detailed thermodynamic properties and superfluid density measurements made by μ SR. Less clear is the status of correlations that may or may not compete with superconductivity and in particular the nature and role of the pseudogap which remains obscure. Here μ SR provides some clear signposts both through the slowing down of spin fluctuations and through the temperature dependence, doping dependence and ground-state properties of superfluid density. These features are summarised, conclusions are drawn and suggestions made for key ongoing μ SR experiments, both for the cuprates and the newly-discovered pnictide superconductors.