
KOLOKVIJ FIZIČKOG ODSJEKA

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Probing the local properties of correlated electron systems: application to cobaltates and iron pnictides

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The strong electronic correlations present in systems such as transition metal oxides induce a rich set of exotic electronic behaviours, including high-temperature superconductivity. Resonance techniques such as NMR, ESR, and muSR are powerful tools to study such physics, thanks to their ability to probe in the bulk the local electronic properties: spin susceptibility and fluctuations, charge environment, internal field distribution, couplings... Focussing on nuclear magnetic resonance results, I will give an overview of the phase diagrams of cobaltates and iron pnictides, two correlated transition-metal compounds displaying unique behaviours. In a first part on sodium cobaltates, I will emphasize the systematic presence of magnetic correlations, as well as that of a doping-dependent energy scale associated to a low-temperature freezing of spin excitations. In a second part on iron pnictides, I will mainly show the presence of a local electronic order in underdoped samples, which acts as a background for the competition between static magnetism and superconductivity.

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