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**NMR investigation of iron-based superconductors**

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We report NMR investigation of the electronic properties of iron-based superconductors with primary focus on the 11 (FeSe) and 122 (Co-doped $BaFe_2As_2$) systems. From the $^{77}$Se and $^{75}$As NMR Knight shift $K$ measurements, we will deduce the intrinsic temperature and concentration dependences of the uniform spin susceptibility, $\chi_{spin}$, in these systems. We will also demonstrate the evolution of antiferromagnetic spin fluctuations (AFSF) as a function of pressure (in FeSe) or the doping level (in $Ba[Fe_{1-x}Co_x]_2As_2$). Our results show that the optimal superconducting phase exists in close proximity with SDW order; superconductivity sets in only after AFSF grow toward $T_c$. This work was carried out in collaboration with F.L. Ning and K. Ahilan (McMaster), T. McQueen and R.J. Cava (Princeton), A.S. Sefat, M.A. McGuire, B. C. Sales, and D. Mandrus (Oak Ridge), P. Cheng, B. Shen, and H.-H Wen (Chinese Academy of Sciences). The work at McMaster was supported by NSERC, CIFAR, and CFI.