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Microwave surface impedance measurements of LiFeAs and LiFe(As,P) single crystals Y. IMAI, H. TAKAHASHI, T. OKADA, A. MAEDA, Dept. of Basic science, the University of Tokyo, K. KITAGAWA, K. MATSUBAYASHI, M. TAKIGAWA, Y. UWATOKO, ISSP, the University of Tokyo, N. NAKAI, Y. NAGAI, M. MACHIDA, Japan Atomic Energy Agency — We report results of microwave surface impedance measurements in LiFeAs and LiFe(As,P) single crystals [1]. These crystals were grown by self-flux method. The surface impedances of crystals were measured by a cavity perturbation technique. The in-plane penetration depth calculated from the surface reactance shows an exponential temperature dependence at low temperatures in both of LiFeAs and LiFe(As,P). This indicates that these materials do not have any nodes in the superconducting gap. The temperature dependence of the superfluid density indicates that LiFeAs and LiFe(As,P) are multi-gap superconductors with at least two isotropic gaps. In addition, the real part of complex conductivity exhibits an enhancement below T_c , which is different from the so-called coherence peak. This is due to the rapid increase of the relaxation time of the quasiparticle below T_c . We believe that this enhancement is rather common to all superconductors where an inelastic scattering is dominant above T_c , irrespective of the strength of the electron correlation.

[1] Y. Imai *et al.*, J. Phys. Soc. Jpn, *in-press*.(arXiv: 1009.4628.)

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