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Local characterization of superconductivity in $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$
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Tokyo, Japan, YUJI MATSUDA, Kyoto University, Japan — We use magnetic force
microscopy (MFM) to characterize superconductivity across the superconducting
dome in $\text{BaFe}_2(\text{As}_{1-x}\text{P}_x)_2$, an isovalently doped pnictide that exhibits a peak in the
penetration depth (λ_{ab}) at optimal doping (x_{opt}), as shown previously in sample-
wide measurements. Our local measurements show a peak at x_{opt} and a T_C vs. λ_{ab}^{-2}
dependence similar on both sides of x_{opt} . Near the underdoped edge of the dome λ_{ab}
increases sharply, suggesting that superconductivity competes with another phase.
Indeed MFM vortex imaging shows correlated defects parallel to twin boundaries
only in underdoped samples and not for $x \geq x_{\text{opt}}$. Furthermore, in underdoped
samples we report stripes parallel to twin boundaries that are visible even in the
absence of vortices.

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