Infrared nano-imaging of phonon polaritons in natural hyperbolic media

Jiahua Duan
Jianing Chen
Institute of Physics, Chinese Academy of Sciences, Beijing, China

duanjiahua@iphy.ac.cn

In this work, we bridge the large momentum-mismatch between HPPs and free space light with natural wrinkle on hBN and realize the wavelength-control of launched HPPs by choosing appropriate dielectric environment. We performed nano-IR imaging of HPPs launched by wrinkles, metal antenna and AFM tip, which are conformed to calculated dispersion relation without exception. The large-momentum components of HPPs were mapped through wrinkle or metal launching. Meanwhile, we provide the first experimental demonstration of controlling HPPs wavelength through changing classical SiO_2 substrate.