

Supplementary Information

Spatial-Temporal Imaging of Anisotropic Photocarrier Dynamics in Black Phosphorus

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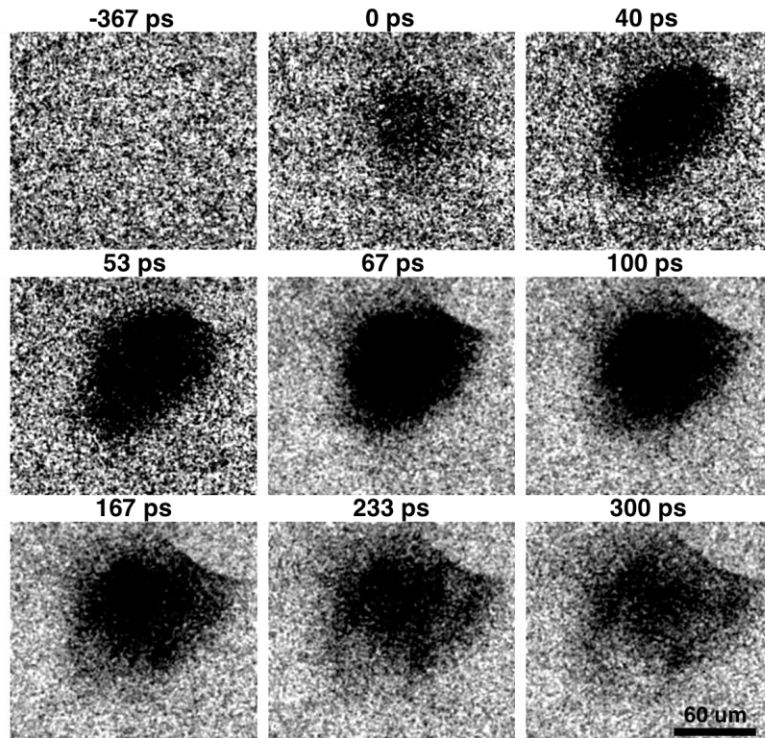
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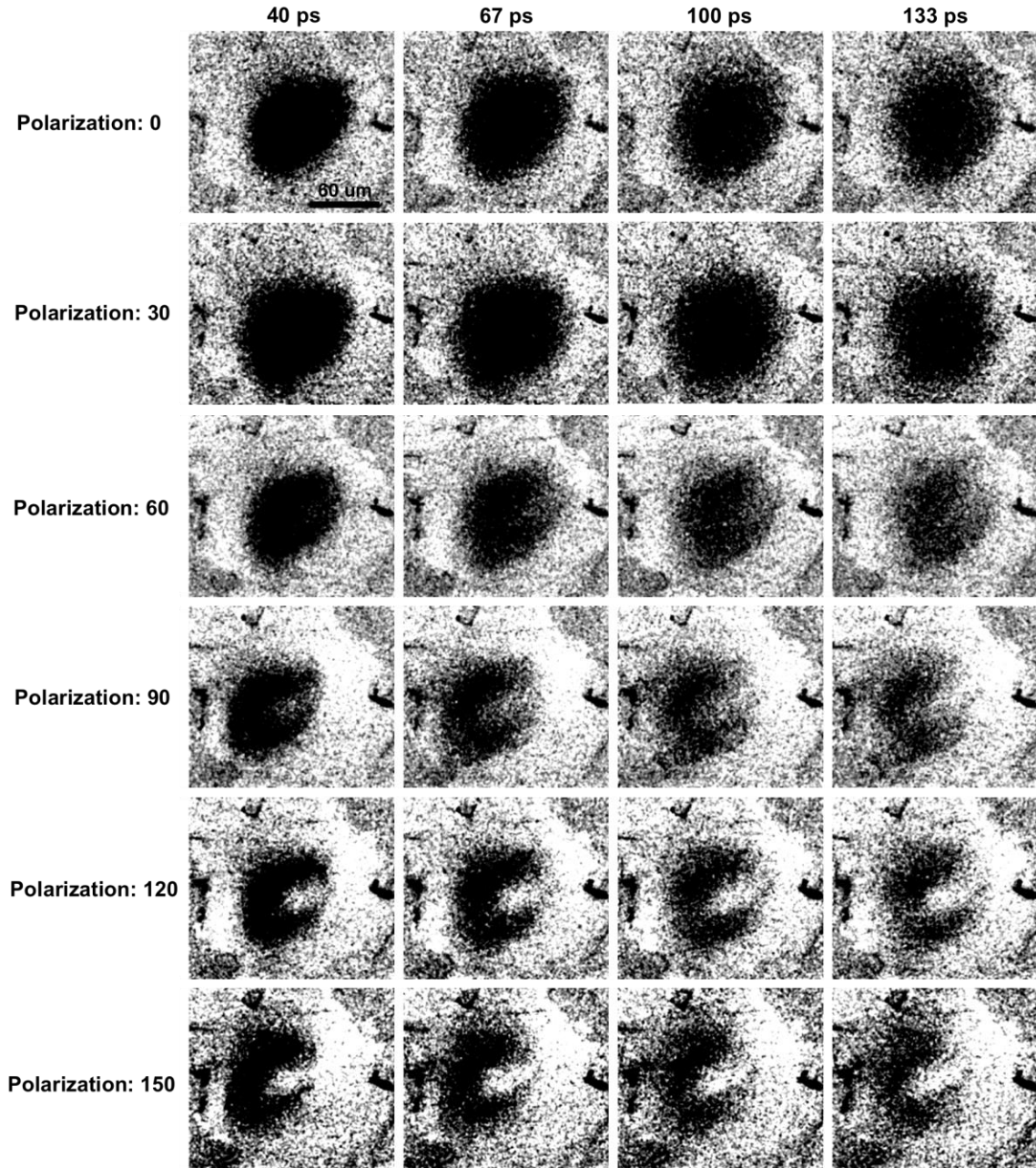
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Supplementary Figure 1. Hot hole dynamics in black phosphorus within 300 ps after photo-excitation. This measurement was done on a different flake of black phosphorus from the one shown in the main text. The feature at the upper right corner is the boundary of the flake.



Supplementary Figure 2. Polarization dependence of the hot hole dynamics in black phosphorus. This measurement was done on a single BP flake with different polarizations of the input pump laser. Although the absorption of the pump laser is different with different polarizations (shown as different shapes and sizes of the induced hole distribution), the subsequent dynamics, namely the anisotropic diffusion, is the same for different polarization directions. The bright spot seen in the last three rows of images is a defect created due to long-time exposure of the sample to the pump laser.