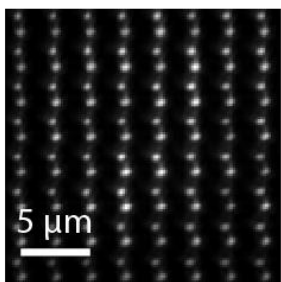
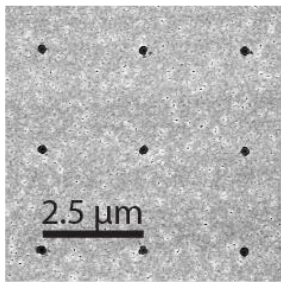
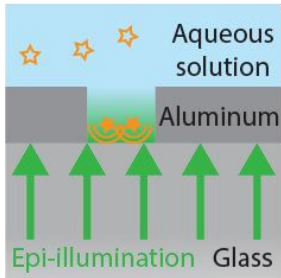


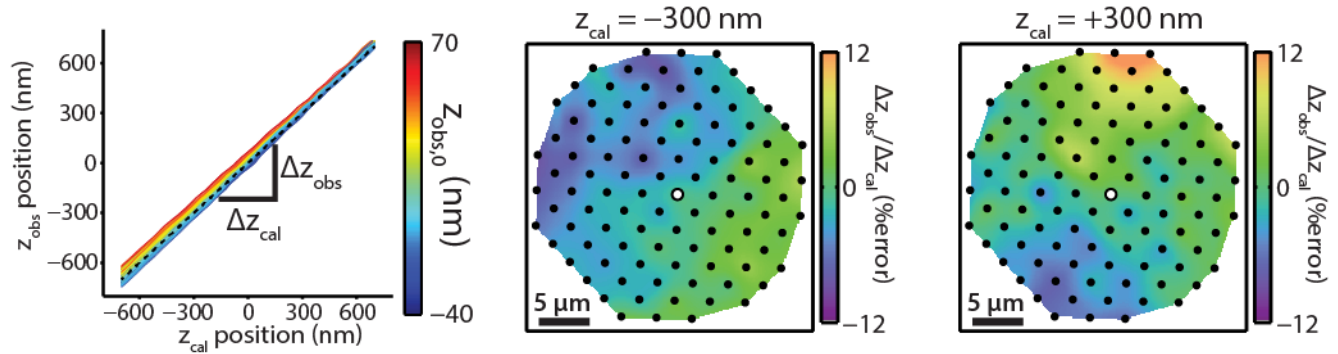
Correcting field-dependent aberrations in 3D localization microscopy with nanoscale accuracy

Single molecules can be localized to 10-40 nm *precision* in 3D, but systematic errors limit localization *accuracy* if not corrected. We show that field-dependent aberrations cause errors up to ~50-100 nm, which can be corrected by calibration.

Nanohole arrays sample full field



Observed rate of change in z position ($\Delta z_{\text{obs}}/\Delta z_{\text{cal}}$) varies ~20% over field of view



This variation causes systematic z-dependent errors in 3D single-emitter localization that can be corrected by using local z calibrations from nanoholes

