Supplementary Video 1: light sweeping across a stripe pattern with varied spatial frequencies

Supplementary Video 2: laser pulse reflection from a mirror

Supplementary Video 3: laser pulse refraction at an air-resin interface

Supplementary Video 4: laser pulse racing in different media

Supplementary Video 5: apparent faster-than-light phenomenon

Supplementary Video 6: pulsed-laser-pumped fluorescence emission