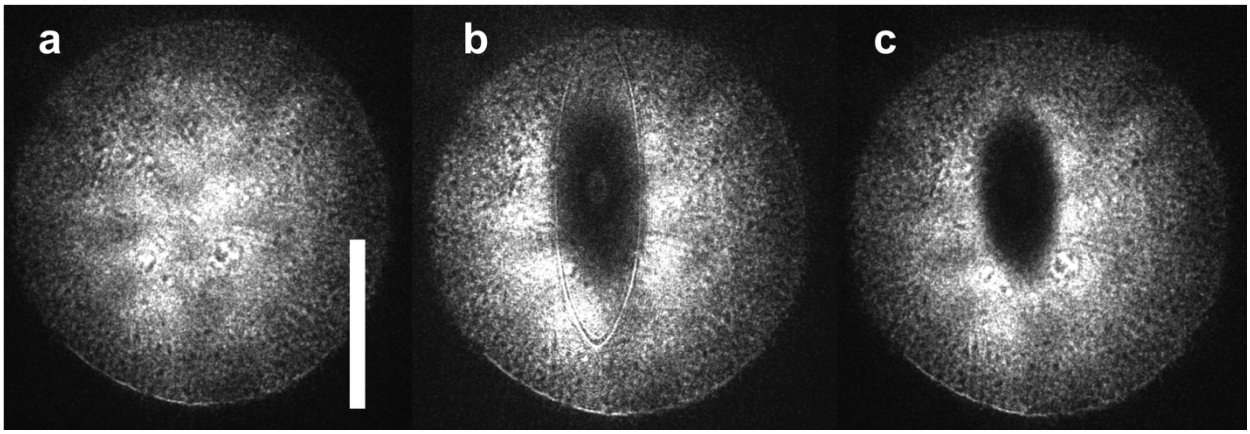

Extended Data Fig. 8. | The supersonic wavefront leaves no permanent trace outside the central laser-damaged region, identifying it as a purely elastic disturbance. Three-image experimental sequence recorded on a Cu(111) thin film with TTB density (2.175 μm^{-1}) under femtosecond laser excitation at 200 mJ/cm^2. **a**, Reference DFXM image recorded before laser arrival (pre-pump). **b**, Single-shot DFXM image acquired at a pump–probe delay of 25.2 ns, capturing the supersonic wavefront propagating radially outward from the excitation centre. **c**, DFXM image of the same sample region recorded after excitation. The central spot shows permanent laser-induced damage from direct absorption. The absence of permanent residual contrast along the wavefront trajectory identifies the wavefront as purely elastic. Scale bar, 100 μm.