## Supporting information for: Early nanoparticle genesis and size manifestation during pulsed laser ablation in liquids dynamics

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Supplementary materials



Figure 1: (Supplement) Sequence of videographs during the bubble formation process on gold with 12ps, 1064 nm pulses at 1 kHz as function of delay after laser impact. The delay step size is 5  $\mu s$ , the scale bar represents 0.5 mm.



Figure 2: (Supplement) Sketch of the ablation chamber indicating the reaction volume covered by polymer foils and the access paths for water, laser and X-rays. The target ribbon is constantly transported upwards.



Figure 3: (Supplement) Videographs during the bubble formation process on silver with 12 ps, 1064 nm pulses (left) and 2 ps, 800 nm pulses (right) at a delay of 5  $\mu s$ , at a 5  $\mu s$  flash duration and a 10  $\mu s$  camera integration time. The white area in the center of the emerging bubble on the left reflects white-light emission from the plasma state. The scale bar represents 0.3 mm.



Figure 4: (Supplement) Ablated masses for silver and gold as function of delay after laser impact for 10 ps , 1064 nm excitation. The partial invariants<sup>1,2</sup> represent masses for small particles (left) and large particles (right) for gold (top) and silver (bottom). The line displays the scaled model 1 for homogeneous bubble filling as described in the article.



Figure 5: (Supplement) Transmission electron micrographs of ablated gold nanoparticles (top) and silver (center) for 10 ps, 1064 nm pulses. The insets show a contrast-boosted image of a single large sphere. The lower images shows HR-TEM images of gold particles from 2 ps, 800 nm pulses with close-ups that reveal the predominant (111) lattice spacing of gold. The blue lines indicate grain boundaries, where visible. On should take note that the largest particles may displayed different grains in the transmission direction. The small particles are typically single-crystalline or twinned.



Figure 6: (Supplement) Size histograms from TEM images in fig. SI5 for 10 ps, 1064 nm pulse ablation together with the cumulative mass distribution for highlighting the large-size fraction.



Figure 7: HR-TEM images from different spherical particles.

## References

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