



Physics > Fluid Dynamics

Surface Nanobubble Nucleation Visualized with TIRF Microscopy

Chon U Chan, Claus-Dieter Ohl

(Submitted on 12 Apr 2012)

Nanobubbles are observed with optical microscopy using the total internal reflection fluorescence (TIRF) excitation. We report on TIRF visualization using Rhodamine 6G at $5\ \mu\text{M}$ concentration which results to strongly contrasted pictures. The preferential absorption and the high spatial resolution allow to detect nanobubbles with diameters of $230\ \text{nm}$ and above. We present a study of the nucleation dynamics from the water-ethanol-water exchange and report the size distributions. Nanobubble nucleation is observed within 4 min after the exchange, later a stable population of nanobubbles with a surface density of $0.55\ \text{bubbles}/\mu\text{m}^2$ is formed. Interestingly, unstable, slowly dissolving nanobubbles are observed during the first stage of water-ethanol exchange; only after the ethanol-water exchange stable nanobubbles appear.

Subjects: **Fluid Dynamics (physics.flu-dyn)**
Cite as: [arXiv:1204.2633v1](#) [physics.flu-dyn]

Submission history

From: Claus-Dieter Ohl [[view email](#)]
[v1] Thu, 12 Apr 2012 07:02:25 GMT (5466kb,D)

[Which authors of this paper are endorsers?](#)

Link back to: [arXiv](#), [form interface](#), [contact](#).

Download:

- [PDF](#)
- [Other formats](#)

Current browse context:

[physics.flu-dyn](#)

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1204](#)

Change to browse by:

[physics](#)

References & Citations

- [NASA ADS](#)

Bookmark (what is this?)

