Modeling of a bubble bouncing on a free surface in super purified water AYAKA SATO, YUSUKE UCHIDA, Kyushu University, MINORI SHIROTA, AIST, TOSHIYUKI SANADA, Shizuka University, MASAO WATANABE, Hokkaido Univeristy — A model for a bouncing of a bubble on free surface in super purified water is proposed. The model is based on mass-spring system and energy conservation system. In order to describing the effect of the bubble and free surface motion in the model, we assume two springs connected in series. We also define that the initial kinetic energy when the bubble contacts with free surface is converted into the increase in surface energy when the rise velocity of the bubble is zero. From the two equations, the contact time which is also the half period of the oscillator is represented by the deformations and the approach velocity. An experiment is also performed to discuss the applicability of the model. Especially, the bubble motion and the free surface deformation are captured. The good agreement is found between the contact time given by images and that derived by the model. However if we consider only the free surface deformation effect, the estimated contact time becomes smaller than that of the model with both of the deformations. We thus conclude that both of the deformation effects are essential for the estimation of the system.

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