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The Experimental Study of Dynamics of Scaled Gas-Filled Bubble Collapse in Liquid ALEXANDER PAVLENKO, RFNC VNIITF — The article provides results of analyzing special features of the single-bubble sonoluminescence, developing the special apparatus to investigate this phenomenon on a larger-scale basis. Certain very important effects of high energy density physics, i.e. liquid compressibility, shock-wave formation under the collapse of the gas cavity in liquid, shock-wave focusing in the gas-filled cavity, occurrence of hot dense plasma in the focusing area, and high-temperature radiation yield are observed in this phenomenon. Specificity of the process is conditioned by the "ideal" preparation and sphericity of the gas-and-liquid contact boundary what makes the collapse process efficient due to the reduced influence of hydrodynamic instabilities. Results of experimental investigations; results of developing the facilities, description of methods used to register parameters of facilities and the system under consideration; analytical estimates how gas-filled bubbles evolve in liquid with the regard for scale effects; results of preliminary 1-D gas dynamic calculations of the gas bubble evolution are presented. The work supported by ISTC Project #2116.

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