Experimental observation of gravity-capillary solitary waves generated by a moving air-suction\textsuperscript{1} BEOMCHAN PARK, YEUNWOO CHO, Korea Advanced Institute of Science and Technology — Gravity-capillary solitary waves are generated by a moving air-suction forcing instead of a moving air-blowing forcing. The air-suction forcing moves horizontally over the surface of deep water with speeds close to the minimum linear phase speed \( c_{\text{min}} = 23 \text{cm/s} \). Three different states are observed according to forcing speed below \( c_{\text{min}} \). At relatively low speeds below \( c_{\text{min}} \), small-amplitude linear circular depressions are observed, and they move steadily ahead of and along with the moving forcing. As the forcing speed increases close to \( c_{\text{min}} \), however, nonlinear 3-D gravity-capillary solitary waves are observed, and they move steadily ahead of and along with the moving forcing. Finally, when the forcing speed is very close to \( c_{\text{min}} \), oblique shedding phenomena of 3-D gravity-capillary solitary waves are observed ahead of the moving forcing. We found that all the linear and nonlinear wave patterns generated by the air-suction forcing correspond to those generated by the air-blowing forcing. The main difference is that 3-D gravity-capillary solitary waves are observed ahead of the air-suction forcing, whereas the same waves are observed behind the air-blowing forcing.

\textsuperscript{1}This work was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Science, ICT Future Planning (NRF-2014R1A1A1002441).

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Date submitted: 12 Sep 2016