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T. R. Akylas* (trakylas@mit.edu) and **Yeunwoo Cho**. *Resonantly Forced Gravity–Capillary Lumps on Deep Water*.

A theoretical study is made of the wave disturbance generated by a locally confined external pressure on the surface of deep water moving with speed V near the minimum gravity–capillary phase speed, c_{min} . According to linear inviscid theory, the response when V equals c_{min} is unbounded, and the interplay of nonlinear and damping effects is crucial close to this resonance. The analysis is based on an approximate model that combines the linear dispersion relation in the vicinity of c_{min} with quadratic nonlinearity as well as viscous damping. For V well below c_{min} , the transient response from rest approaches the small-amplitude steady state predicted by linear theory, but nonlinear effects come into play at a certain forcing speed, $c_{crit} < c_{min}$, that depends on the strength of the forcing. Past this critical speed, the response jumps to a finite-amplitude state comprising a gravity–capillary lump on the downstream side of the excitation. A time periodic state is also possible for a range of forcing speeds slightly below c_{min} . This latter state involves periodic shedding of lumps that get damped quickly as they propagate downstream. The predictions show good agreement with experiments conducted by J. H. Duncan and J. D. Diorio at Maryland. (Received August 27, 2009)