Supporting Information for "On the Thermal Signature of the Residual Foam in Breaking Waves"

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Additional Supporting Information (Files uploaded separately)

Caption for Movies S1 to S4:

Movie S1 and Movie S2. A sequence of images of a breaking wave with a slope of $S = 0.35$ for Movie S1 and $S = 0.37$ for Movie S2. Movie S2 corresponds to the images in Figure 3 and Figure 7 in the paper. The movies are captured and played at 15 fps. The wave is propagating from left to right. The wave packets are designed so that the breaking occurs at the edge of the field of view. (Left) Bubble plume images taken from the camera that is looking through the glass wall of the tank. (Top right) Visible foam images taken by the camera that is looking down at the water surface. The foam images are shown in the same coordinate system as of the infrared camera images. (Bottom right): infrared images showing the surface temperature of the foam. The temperature range is 0.3 $°C$ with dark meaning cold and bright meaning warm. The blue outlines show the location of the foam extracted from the visible foam images. Each image is approximately 1.2 m long.

Movie S3 and Movie S4. A sequence of ensemble-averaged intensity images of the bubble plume (left), the foam (top right), and the surface temperature (bottom right), for the experimental condition with a slope of $S = 0.35$ in Movie S3 and $S = 0.37$ for Movie S4. Movie S4 corresponds to the images in Figure 10 in the paper. The movies are captured and played at 15 fps. Each frame in the foam (bubble plume) movies is the result of averaging the same frame of foam masks (bubble plume mask) relative to the start of breaking, among all the runs with the same conditions. Therefore, the intensity value at each pixel is equal to the fraction of runs in which the pixel was covered by foam (bubbles). Similarly, the infrared movie is the result of ensemble averaging of all the runs with the same condition. The temperature range in the infrared movie is 0.2 $^{\circ}C$ with dark meaning cold and bright meaning warm.