

## APPENDIX

### Quick guide for setting the digital camera Casio EX-FS10 to 210 frames/second and viewing videos frame by frame.

This high-speed camera is currently not connected to a computer and is not run for viewing the current pattern formation on line. The camera must be used for taking videos of the surface waves at a rate of 210 frames/second. To verify whether the camera is set to this rate, check the switch (1) on the back panel (see Fig.A1). It must be in a position “HS” which is the upper position of the switch.



FIG.A1: Back panel of the camera EX-FS10

1. Screw the camera to either the top holder or to the side holder; you can find thread in a hole (2).
2. Place a vessel with a substance under test on the shaker and stick it to the shaker's plate.
3. Turn on the camera with the button (3).
4. Using the display, adjust the positions of the halogen lamp(s) and the camera to create a bright clear image and to eliminate reflections from the surface of the substance in the vessel. Zooming may be helpful.
5. Turn on the shaker in a test regime to further adjustment of the camera and lamp(s) positions. The camera will turn off automatically if a photo or video are not taken during several minutes.
6. To start or to stop the camera, press the red record button (4). Take a test video for about 2-3 seconds to finally adjust the position of the camera and lights. A timer is shown on the display. Your video record should not take more than 5 seconds.
7. On the right, there is the USB/AV port (5) where you can connect up your camera to your computer. All videos from the EX-FS10 are captured into .AVI files.
8. Copy the file into the folder “Local Disc (T)”. It will be saved for your future work. Disconnect the camera and work with the file on the disc “T”.
9. Right click on the icon of the file with your video and select “Play with VLC media player”. Watching the recorded video, select a position on the substance surface with the clear image of oscillating standing wave. You will focus on viewing this particular point frame by frame.
10. To view the video frame by frame and calculate the frequency of the standing wave, choose the function “Advanced controls” in the option “View” of the VLC player. There will appear two rows of function buttons at the lower left corner of the computer screen. The rightmost button in the upper row permits to view the video frame by frame.
11. Knowing the frame rate and counting the number of frames taken for one or several periods of the standing wave vibration, it is possible to calculate the period and frequency of oscillation of the standing wave.



Taking a lot of high-speed movies will discharge the camera battery very quickly. The charger is stored in MP 251 A and will be available upon request.

The full manual for the camera can be found here

<http://www.digitalcamerareview.com/default.asp?newsID=3999&review=casio+exilim+fs10>