

Abstract Submitted
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Fabrication and calibration of sensitively photoelastic biocompatible gelatin spheres HENRY FU, ERICSON CENICEROS, ZEPHYR MCCORMICK, University of Nevada, Reno — Photoelastic gelatin can be used to measure forces generated by organisms in complex environments. We describe manufacturing, storage, and calibration techniques for sensitive photoelastic gelatin spheres to be used in aqueous environments. Calibration yields a correlation between photoelastic signal and applied force to be used in future studies. Images for calibration were collected with a digital camera attached to a linear polariscope. The images were then processed in Matlab to determine the photoelastic response of each sphere. The effect of composition, gelatin concentration, glycerol concentration, sphere size, and temperature were all examined for their effect on signal response. The minimum detectable force and the repeatability of our calibration technique were evaluated for the same sphere, different spheres from the same fabrication batch, and spheres from different batches. The minimum force detectable is $10\ \mu\text{N}$ or less depending on sphere size. Factors which significantly contribute to errors in the calibration were explored in detail and minimized.

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