

Subjective Evaluation of Crash Behavior of Muscle at Subsonic Level for Simulation of Bird-strike

* Naoki Torii ¹, Atsushi Sakuma ², and Hirokazu Shoji³

¹Graduate School of Engineering, Tokyo University of Agriculture and Technology,
2-24-16 Naka-cho, Koganei-shi, Tokyo 184-8588, Japan

²Institute of Technology, Tokyo University of Agriculture and Technology,
2-24-16 Naka-cho, Koganei-shi, Tokyo 184-8588, Japan

³Japan Aerospace Exploration Agency (JAXA),
6-13-1 Osawa, Mitaka-shi, Tokyo 181-0015, Japan

*Corresponding author: 50012643042@st.tuat.ac.jp

Miniaturization and lightening of airplane are advanced to improve its economic efficiency, and the safety technology of airplane design becomes difficult while the accident of bird-strike is increasing year by year. Then a system of shock impact test by using airsoft rifle is developed to evaluate the design technology of anti-bird strike structure of airplane. The viscoelastic characteristics of specimen is evaluated by analyzing stress response using the modified Hertz contact theory and the wave equation at the moment when simple ball bullet is shot to specimen by the airsoft rifle. In the results of experiment, the obvious relationship is observed subjectively between quasi-static and impact responses of specimen. The evaluated viscoelastic relationship is applied to simulate the impact test by using LS-DYNA with fundamental viscoelastic constitutive equation and the material parameters derived from the impact test, and the well similar behavior has been simulated by the constitutive equation. By using the developed technology here, the phantom imitating real bird will be developed as standard specimen for an anti-bird strike test in future.

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