IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Interactive Presentations - IAF MATERIALS AND STRUCTURES SYMPOSIUM (IP)

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DESIGN OF A DEVICE TO SLOW THE MOTION AND VERTICAL DESCENT OF A WATER ROCKET INSPIRED BY TROPICAL SEEDS FROM COSTA RICA

Abstract

The project design is framed in the project: "C1461 Mobile Laboratory of Action and Thought in Biomimetic Arts" in which an interdisciplinary group of researchers and students from the Universidad de Costa Rica collaborated in multiple iterations to develop an innovative way to solve design challenges in aerospace engineering and, embed in rocketry, functions that emulate adaptations observed in nature. After taking Costa Rican South Pacific seeds as mentors through biomimicry philosophy, the development of the main deliverable of the project, which consists of a design and proof of a parachute system based on the principle of flying seeds was fulfilled. Several experimental steps were developed: 1. the conceptual design, 2. material selection, 3. design optimization, 4. prototyping, 5. testing and evaluation in the laboratory, 6. testing and evaluation in the field, 7. final report and design, and 8. demonstration and divulgation of the results. In this scientific article, we elaborate on all these stages with special emphasis on the evaluation stage in the laboratory and the open field. It is important to highlight that the project is rooted in a highly vulnerable area of Costa Rica where the researchers intentionally evoke an inclusive call as an inspiration to potentiate people's involvement and curiosity in the scientific and technological development of our country.