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THE 2015 BALLOONSAT WORKSHOP: OUTREACH THROUGH FLIGHT

Abstract

Engaging students in hands-on science activities is critical to promoting Science, Technology, Engineering, and Mathematics (STEM) fields and to building the next generation engineering workforce. Community college students are often overlooked in many STEM outreach activities. The 2015 BalloonSat Workshop was developed to provide a unique learning experience directly engaging both students and instructors in the technologies of high-altitude ballooning with a target audience of minority serving institutions. The four day workshop, held in January of 2015 in Huntsville, Alabama, focused on payload design, flight operations, and data analysis. The workshop team drew from the experiences of experts in government, industry, academic, and hobbyist ballooning to build a curriculum to introduce critical technologies. Lessons included ballooning mechanics, flight-day logistics, embedded systems design, basic circuit assembly, payload assembly, flight software design, and safety. The goal of the workshop was to encourage schools without ballooning experience to launch a ballooning mission on their own. 10 community college teams and 1 university team participated in the event. Each team was taught how to develop and operate a scientific payload containing analog and digital sensors. The basics of ballooning were discussed, with presentations from eminent balloonists in the Huntsville area. The schools were split into three flight lines, and everyone participated in some aspect of the balloon flight preparation. The authors will present a description of the flight hardware, software, curriculum developed for the event, and the preparations that went into the development of each. The proceedings of the workshop will be discussed, with a focus on flight day and recovery. The experiences of the workshop team and the participants will be summarized, and the positive and negative aspects of the event considered. Additionally, future workshop plans will be considered.