Abstract Submitted
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Simulating the EUSO-SPB2 Balloon Flight Train with Lagrangian Mechanics[1] RYAN MORGENSTERN, Colorado School of Mines, JEM-EUSO TEAM[2] — EUSO-SPB2 is a long duration balloon experiment that will fly two optical astroparticle telescopes; a fluorescence telescope and a Cherenkov telescope. These telescopes have a 0.1 degree pointing resolution requirement. The telescope of interest is the on-board Cherenkov telescope that rotates above/below the Earths limb to observe extensive air showers and tau neutrinos backgrounds. Rotating the Cherenkov telescope induces motion in the gondola. Motion in the gondola exceeding the 0.1 degree resolution requirement may affect data. This presentation analyzes and simulates this telescope induced gondola motion to determine if dampening methods are required. The simulation model is additionally tested against a wood built small-scale payload with an internal rotating telescope. With this experimental basis, the simulation model accurately scales to the measured motion of the different motors and payload suspensions used. The simulation model is then built for the EUSO-SPB2 payload and flight train. Results predicted telescope induced gondola motion $\phi \leq 0.008$ degree. With proven confidence in the simulation model, EUSO-SPB2s on-board telescopes data will not be affected by the Cherenkov telescope rotation. Partially funded by NASA grant NNX13AH55G.

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