Abstract Submitted
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Focal plane actuation for the development of a high-resolution suborbital telescope ALEXANDER MILLER, PAUL SCOWEN, ASU SESE, TODD VEACH, NASA — We present a hexapod stabilized focal plane as the key instrument for a proposed suborbital balloon mission. Balloon gondolas currently achieve 1-2 arcsecond pointing error, but cannot correct for unavoidable jitter movements caused by wind rushing over balloon surfaces, thermal variations, cryocoolers, and reaction wheels. The jitter causes image blur during exposures and limits the resolution of the system. To solve this, the hexapod system actuates the focal plane to counteract the jitter using position information supplied by star-trackers. Removal of this final jitter term decreases pointing error by an order of magnitude and allows for true diffraction-limited observation. This boost in resolution will allow for Hubble-quality imaging for a fraction of the cost. The alternative, tip-tilt pointing systems, require additional optics and introduce multiple reflections, while the hexapod is compact and can be plugged into the focal point of nearly any configuration. High-resolution time domain multispectral imaging of the gas giant outer planets, especially in the UV range, is of particular interest to the planetary community, and a suborbital telescope with the hexapod stabilization in place would provide a wealth of new data.

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