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**Dimensional Stability of Materials for Space-Based Missions** ALIX PRESTON, BENJAMIN BALABAN, GABRIAL BOOTHE, GUIDO MUELLER — Space-based missions such as LISA, SIM, or Darwin rely on Michelson-type interferometry for detection. Optical systems for these missions must be made out of materials that can withstand significant acceleration and vibrational stresses endured during launch in addition to maintaining their dimensional stability. Of equal importance are the bonding methods used to adhere optical components. A recent bonding technique known as hydroxide bonding has proven to have superior strength to most other bonding techniques like optical contacting. Thermal expansion and material or bond internal effects like stress relaxation, creep, aging of the material or bonds often affect the interferometric stability of optical systems. In this poster we present results for the dimensional stability of silicon carbide, Zerodur, and Super Invar; all of which are commonly used materials in space-based missions. In addition, we expand on existing results for glass to glass bonding and introduce new results for glass to silicon carbide bond strengths using the hydroxide bonding technique. This work is supported by NASA/OSS grant APRA04-0095-0007.

Alix Preston

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