

IAF MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
Microgravity Experiments from Sub-Orbital to Orbital Platforms (3)

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COMPARATIVE ANALYSIS OF A MICROGRAVITY COMPUTED AXIAL LITHOGRAPHY (CAL)
BASED SYSTEM TO A GRAVITY AFFECTED CAL SYSTEM**Abstract**

Computed Axial Lithography (CAL), is a recent advancement in additive manufacturing that reduces many known restrictions on traditional additive manufacturing technologies, such as no need for supports, no layering, and quick manufacturing times. However this technology has a flaw, when a part is formed it will increase in density and if a material's viscosity is low enough the part will begin to sink. One solution to this has been printing with higher viscosity materials to reduce this effect. However this reduces the amount of materials that can be used with this process. For this, CAL is to be tested in an environment where gravity does not affect the printing process. Various geometries will be printed to observe how they behave in various viscosity materials. One concern is even without the effects of gravity these materials may see fluid flows that affect the quality of the part. This may be from flows caused by inertial or heat effects. CAL will fly on a microgravity parabolic flight in May 2022 to test all of these and analyze how a CAL system in a microgravity environment compares that to a system under the effects of gravity. Expected results shortly after is that lower viscosity materials will now be viable in this environment, and will allow for high quality parts printed with these materials that would be otherwise impossible.